



*"Amateur Mechanic  
& Work" Handbooks*

# BOOT MAKING AND MENDING



· CASSELL AND COMPANY LTD., LONDON ·  
TORONTO, MELBOURNE & SYDNEY

# “AMATEUR MECHANIC & WORK” HANDBOOKS

A Series of Practical Manuals Illustrated  
with numerous Drawings and Diagrams.

1/6 net each, from all booksellers, or post free, 1/9, from  
CASSELL & Co., Ltd, La Belle Sauvage, London, E.C.4

- Basket Making.** Contents include: Basket Makers' Materials and Tools. A Small Marketing Basket. The Round "Bushel" or "Half-Bushel," Basket or Sieve. The Round "Peck" Basket. An Oval Shopping Basket. An Oval Packing Hamper. A Clothes' Basket. A Pot Hamper or Fruit Basket. A Square-lidded Hamper. A Laundry Hamper. Index, etc.
- Book-Binding.** Contents.—Bookbinders' Appliances, Folding Printed Book Sheets. Beating and Sewing. Rounding, Backing and Cover Cutting. Cutting Book Edges, Covering Books. Cloth-bound Books, Pamphlets, etc. Account Books, Ledgers, etc. Colouring, Sprinkling and Marbling Book Edges. Marbling Book Papers. Gilding Book Edges. Sprinkling and Tree Marbling Book Covers. Lettering, Gilding and Finishing Book Covers.
- Boot Making and Mending.** Contents.—Repairing Heels and Half-soleing. Patching Boots and Shoes. Re-welting and Re-soleing. Bootmaking. Lasting the Upper. Sewing and Stitching. Making the Heel. Knifing and Finishing. Making Riveted Boots and Shoes. Index.
- Building Model Yachts.** Contents.—The Hull, Method of Design. Drawing and Developing the Hull. Carving the Hull from the Solid. The "Bread and Butter" System of Hull Construction. Plank Building. A Model 10-Rater Racing Yacht. Building a Model Clipper, Description. A Model Clipper, Hull, Deck and Fittings. A Model Clipper, Masts, Sails and Rigging. Building a Model Racing Motor-Boat; the Hull, the Boiler, the Engine, Boiler-Feed Arrangements. With 172 illustrations.
- Camera Making.** Essentially practical and profusely illustrated instructions on making Box, Folding, Reflex, Stereoscopic and Enlarging Cameras, etc. Makes clear optical principles involved in construction and operation. Every detail clearly shown and described.
- Clock Cleaning and Repairing.** Chapters include: Clock Repairers' Tools and Materials, General Repairs to Escapements, Cleaning Simple Clocks, Cleaning Dutch Clocks. Strike and Alarm Work, Cleaning Regulator Clocks, Cuckoo Clocks—Mechanism and Cleaning, Pendulums, etc., etc.
- Cycle Repairing and Adjusting.** Contents.—The Bicycle and its Parts. Overhauling a Bicycle. Repairing Tyre Covers and Tubes. Free Wheels. Coaster Hubs and Variable Speed Gears, etc. 79 illustrations.
- Domestic Jobbing.** Contents.—Soldering and Brazing. China Riveting and Repairing. Chair Caning. Furniture Repairing. Glazing Windows, Umbrella Making and Repairing. Lock Repairing and Key Fitting, etc. etc. 157 illustrations.
- Dynamo and Electric-Motor Building.** Contents.—Introduction. Dynamo-Electric Currents. Commutation. Types of Field-Magnets. Armatures, Brushes and Brush Gear. Insulation; Field-Magnet Winding. Hand-wound Armatures. Former-wound Armatures. Building a 120-watt Motor-Dynamo Converter. Building Various Dynamos and Motors. Motor Starters and Resistances. Testing Dynamos and Motors for Faults. Index.
- Dynamo and Motor Erection and Management.** Contents.—Some Electrical Terms Explained. Selection of Machines. Installation. Cable Installation. Switches and Fuses. Starters, Controllers and Regulators for A.-C. Currents. Starters and Controllers for C.-C. Currents. Faults and Troubles. Avoidance and Treatment of Electric Shock. Index.
- Electric Accumulators.** Contents.—The Electric Current. Principle of the Accumulator. Construction of Accumulators. Instructions on Erecting and Starting an Accumulator Plant. Managing, Maintaining, and Repairing an Accumulator Plant. Charging Accumulators from Direct Current Sources. Charging Accumulators from Alternating Current Sources. The Use of the "Booster" in Accumulator Plants. Various Types of Accumulators described. Definitions to Chief Terms Relating to Accumulators. Home-made Pocket Accumulators. Index.

**Cassell's**

## **"WORK" HANDBOOKS (continued)**

- Electric Bells and Telephones.** Contents include: How Electric Bells Work, Electric-bell Wires, Practical Electric-bell Wiring, Electric-bell Faults, Tests and Remedies, Batteries, Telephone Receivers and Transmitters, Complete Telephone Station described, Domestic Telephones and their Connections. Index.
- Electric Clocks.** Contents.—The Principles and Working of an Electric Clock. A Simple Electric Clock. A Three-quarter-Seconds Clock with Chime Release. Improvements to Electric Clocks. Cases for Electric Clocks, Electric Impulse Clocks, Electric Clock Chimes. Index.
- Electric Lighting.** Contents include: Systems of Current Supply, the Fittings, Illumination, Scheme of Distribution; the "Lay-out" Diagram, the Conduit System, Testing and Installation, Wiring Rules and Regulations, Jointing Wires, Wiring an £800 House.
- Electric Primary Batteries.** Contents.—Carbon-zinc Cells. Copper-zinc Cells. "Dry" Cells. Making an Electric Torch. 91 Illustrations.
- Electro-Plating.** Contents.—Introduction. Tanks, Vats, and other Apparatus. Batteries, Dynamos, and Electrical Accessories. Appliances for Preparing and Finishing Work. Silver-plating. Copper-plating. Gold-plating. Nickel-plating and Cycle-plating. Finishing Electro-plated Goods, etc. etc. 77 Illustrations.
- Furniture Repairing.** Contents.—Materials and Tools, Kitchen, Parlour and Dining Chairs, Drawing Room Settee, Cupboards and Boxes, Mirrors, Repolishing, etc. With 100 Illustrations.
- Gilding, Silvering and Bronzing.** The chief processes, electrical and otherwise, of gilding, silvering, and bronzing metalwork, woodwork, leatherwork, book covers, etc., etc., are explained, and a special section relates to the silvering of glass, and describes the best methods with limited appliances.
- Glass Writing, Embossing, and Fascia Work.** Contents.—Plain Lettering and Simple Tablets. Gold Lettering. Blocked Letters. Stencil Cutting. Gold Etching. Embossing. Incised Fascias. Arrangement of Words and Colours. Wood Letters. Illuminated Signs, Temporary Signs, etc. 129 Illustrations.
- Gramophones and Phonographs.** Contents include: Principles of Sound Reproduction, Lubrication, Speed Regulation, etc., the Needle and the Stylus, Making a Gramophone Reproducer, Horns or Trumpets, Inserting New Springs in Motors, Making Records at Home, Making Recorders for Phonographs, etc., etc.
- The Handyman's 1,000 Practical Receipts.** Contents.—Recipes for Brass Lacquers, etc. Bronzes for Metals. Cements of very many kinds. Cleaning various Materials and Objects. Distemper Paints, Enamels, Glues, Hat Bleaches, etc. Inks of many kinds. Leather Dressings, etc. Metal Polishers, Paints, Pastes, Polishes, Soaps, Stains, Varnishes, Waterproofing, Waxes, etc., etc., etc.
- House Painting and Decorating.**—Contents include: The House-Painter's Tools, Distempers, Cellings, Using Ready-made Paint, Painting Walls, Varnishing, Enamelling, Paperhanging, Stencil Decoration, etc., etc.
- Household Repairs.** Contents.—Inserting a Pane of Glass. Plugging Walls. Making Doors Draught-Tight. Roller Blinds. Repairing Roofs, etc.
- Incubators and Chicken-Rearers.** Contents include: Principles of Incubation, Natural and Artificial, an easily made 100-Egg Incubator, a New Design of Hot-Air Incubator, Successful Incubator Management, various Incubators described, Chicken Rearers or Foster-Mothers.
- Induction Coils.** Contents.—Constructing a Shocking Coil. Regulator Medical Induction Coils. How to Make a 6-in. Spark Coil. Mercury and Electrolytic Interrupters. Tesla High-Frequency Coil. Repair of Induction Coils. Simple Commutators. Index.
- Knotting and Splicing Ropes and Cordage.** Contents.—Introduction: Rope Formation. Simple and Useful Knots. Eye Knots, Hitches, and Bends. Ring Knots and Rope Shortenings. Ties and Lashings, etc. 208 Illustrations.
- and Adjustment.** Contents.—The Principle of the i-Tension Magneto. The "Inductor" Magneto. Dismantling. Adjustment and Repair. Fitting and Timing. Flywheel Magnetos. Ford Magneto-Dynamo. Typical Magnetos. Magneto Construction. Index. Fully Illustrated.
- Miniature Electric Light.** Chapters include: Lamps and Fittings, the Coupling-up of Cells and Lamps. Erecting Miniature Lighting Systems. Lighting a Room from Accumulators, Making Pushes and Switches, Accumulators—Making, Charging and Managing, etc. etc.

**Cassell's**



## "WORK" HANDBOOKS (continued)

- Motor-Car Overhaul and Adjustment: Fully Illustrated.** Contents include: Introduction, How the Petrol Engine Works, The Engine: Preliminary Tests, Dismantling and Decarbonising the Engine, Fitting, Adjusting, and Re-metalling Bearings, Engine Piston, Cylinders and Valves, Assembling the Engine, Overhauling the Carburettor, Overhauling the Magneto, Timing the Valves and Ignition, Overhauling the Transmission, the Radiator, Water Jackets and Tanks, The Rear Axle, Brakes and Springs, The Front Axle and Steering Mechanism, Overhauling the Electric Heating and Starting System, Tyres, Painting and Varnishing.
- Motor Cycles and Side Cars: Construction, Management and Repairs.** Contents.—Choice of Machine. Two-Stroke and Four-Stroke Engines. Carburation. Ignition. Transmission and Gears. Locating Faults Overhaul. Tyres. Driving. Index.
- Mounting and Framing Pictures.** Contents.—Making Picture Frames. Notes on Art Frames. Picture Frame Cramps. Making Oxford Frames. Gilding Picture Frames. Methods of Mounting Pictures. Making Photograph Frames. Frames covered with Plush and Cork. Hanging and Packing Pictures. 240 Illustrations.
- Oxy-Acetylene Welding.** Contents include: The Oxy-Acetylene Flame. The Oxy-Acetylene Blowpipe Described. Acetylene Generation. Purification. Valves, Gauges and Regulators. High-pressure System of Oxy-Acetylene Welding. Welding Sheet Iron, Wrought Iron and Mild Steel Plates. Welding Iron and Steel Castings. Index, etc.
- Patents, Designs and Trademarks.** By A. Milward Flack, F.C.P.A. A Concise Guide to the Patenting of Inventions, and the Registration of Designs and Trademarks.
- Photography Simplified.** Contents include: Lenses, the Dark Room and its Fittings, Developing the Negative, Improving Faulty Negatives, Toning Bromide and Gaslight Prints, Landscape Photography, Retouching Portrait Negatives, Lantern Slides, Printing-in Clouds, etc. etc.
- Pianos: Their Construction, Tuning, and Repair.** Contents.—Piano Construction. The Action. The Purchase and Choice of a Piano. Care. Maintenance and Cleaning. Tuning. Repairs' Tools. Repairing Piano Actions. Restringing and other Repairs. Polishing and Renovating Piano Cases and Keyboards. Index.
- Poultry Houses and Appliances.**—Chapters include: The Building of Poultry Houses, Nesting Boxes and Trap Nests, Coops, some Special Pens, Scratching Sheds, etc., Intensive System Poultry Houses described in detail; Cold Chicken Rearers, etc.
- Practical Leather Work: Fully Illustrated.** Contents include: Leather-working, Tools and Their Uses, The Leather: Its Varieties and Treatment, Simple Stitched Work, Purses, Wallets and Pocket Books, Ladies' Handbags, Suit and Attaché Cases, Photographic Frames and Clock Cases, Blotters, Thonged Work, Modelling, Incising, Punching and Stamping, Pyrography and Stencilling, Encrusted, Mosaic and Other Decorations, Gilding and Lacquering, Staining Book Covers.
- Practical Upholstery: Illustrated.** Contents include: Tools and their Special Uses, Materials, Stuffings and Sundries, Upholstering Pin-cushion Chairs, Dining-room Chairs. A Carver Chair, Spring-seat Drawing-room Chair, Chairs with Loose Lift-off Seats, "Show Wood" Easy Chair, Stuff-over Easy Chair, Footstools, A Fender Stool and a Pouffe, Music Stools, A Chesterfield, A Spring-seat Couch, An Ottoman Couch, Box Ottomans. Index.
- Rustic Carpentry.** Contents.—Light Rustic Work. Flower Stands Vases, etc. Tables. Chairs and Seats. Gates and Fences. Rosery Walk. Porches Canopy for Swing. Aviary. Foot-bridges. Verandahs. Tool Houses, Garden Shelters, etc. Summer Houses.
- Simple Lathe and Its Accessories, The.** Contents.—Types of Lathes. Some Small Lathes Described. Centres, Catch Pins, Catch Plates and Carriers. Chucks and Angle Plates. Faceplates. Mandrels. Steadies, Hand-rests and Slide-rests. Lathe Attachments. Driving the Lathe. The Woodturning Lathe and its Accessories. Lathe Speeds and Feeds. Index.
- Small Dynamos and How to Make Them (including Electric Motors).** Describes the construction of a number of small and model dynamos and electric motors, including a 60-watt "students'" dynamo, a hand-driven dynamo for experimental purposes, electric motors for model trams and locomotives, etc. etc. A feature of the book is a detailed description of, with instructions on making, a cycle-lighting dynamo driven by contact with the road wheel.

**Cassell's**

**"WORK" HANDBOOKS**

**BOOT MAKING AND MENDING**

E09807



# **BOOT MAKING AND MENDING**

**INCLUDING  
REPAIRING, LASTING, AND FINISHING**

**EDITED BY  
PAUL N. HASLUCK**

**WITH 179 ENGRAVINGS AND DIAGRAMS**



**CASSELL AND COMPANY, LTD.**  
**London, Toronto, Melbourne and Sydney**

<i>First published</i>	<i>April</i>	1893.
	<i>February</i>	1896.
<i>Reprinted</i>	<i>January</i>	1898.
"	<i>March</i>	1900.
"	<i>March</i>	1902.
"	<i>December</i>	1903.
"	<i>March</i>	1906.
"	<i>April</i>	1907.
"	<i>May</i>	1909.
"	<i>January</i>	1911.
"	<i>September</i>	1912.
"	<i>November</i>	1915.
"	<i>August</i>	1917.
"	<i>September</i>	1918.
"	<i>April and</i>	
"	<i>August</i>	1919.
"	<i>March</i>	1920.
"	<i>November</i>	1921.
"	<i>September</i>	1923.
"	<i>March</i>	1925.
"	<i>September</i>	1928.

ALL RIGHTS RESERVED  
 Printed in Great Britain.

## PUBLISHERS' NOTE

THIS Handbook, undoubtedly the most successful as well as the most practical that has ever been published on the subject, was originally contributed in the form of articles to "Work," a journal which has now ceased publication under that title.

Its author, Mr. William Greenfield, has spent his life at the craft of making and repairing boots and shoes, and is an acknowledged expert of obviously outstanding experience.

# CONTENTS

CHAP.	PAGE
I.—Repairing Heels and Half-soling . . . . .	9
II.—Patching Boots and Shoes . . . . .	32
III.—Re-welting and Re-soling . . . . .	50
IV.—Boot Making . . . . .	62
V.—Lasting the Upper . . . . .	75
VI.—Sewing and Stitching . . . . .	84
VII.—Making the Heel . . . . .	99
VIII.—Knifing and Finishing . . . . .	120
IX.—Making Riveted Boots and Shoes . . . . .	148
Index . . . . .	157

# LIST OF ILLUSTRATIONS

FIG.	PAGE	FIG.	PAGE
1.—Worn Heel prepared for Mending . . . . .	10	45.—Sole raised to receive Underlay . . . . .	44
2.—New Half Heel, with Rivets to Resist Wear . . . . .	11	46.—Leather Skived to form Underlay . . . . .	45
3.—Half-heel Piece Holed and Hammered . . . . .	12	47.—Skiver for Levelling . . . . .	45
4.—Home-made Awl . . . . .	13	48.—Toe-piece and Underlay . . . . .	46
5.—Top of Awl Handle . . . . .	13	49.—Loop Stitching . . . . .	47
6.—Cut Bill . . . . .	13	50.—Seat Stitching . . . . .	47
7.—French Brad . . . . .	13	51.—Stitch Drawing . . . . .	48
8.—Half-heel Piece Bradded . . . . .	14	52.—Grafting Sole to Waist . . . . .	51
9.—Snow's Leather-plugged Half-tip . . . . .	15	53.—Cutting Welts . . . . .	52
10.—Heel prepared for Half-tip . . . . .	15	54.—Welt prepared for Sewing . . . . .	53
11.—Fixing Heel with Screws . . . . .	16	55.—Sewn Graft . . . . .	53
12.—Sharpening Strop . . . . .	17	56.—Fitting, stitching, and Sewing . . . . .	55
13.—End View of Strop . . . . .	17	57.—Sewing-awl . . . . .	57
14.—Shoemaker's Bench . . . . .	19	58.—Blade of Stitching-awl . . . . .	57
15.—Heel prepared for Repairing . . . . .	20	59.—Section of Boot . . . . .	58
16.—Rivets in a Boot Sole . . . . .	21	60.—Rubbing down Channel . . . . .	59
17.—Iron Foot used in Re-soleing . . . . .	22	61.—Fudge-wheel . . . . .	59
18.—Iron Last and Stand . . . . .	22	62.—Waxing the Thread . . . . .	60
19, 20.—Last Stands, with Reversible Foot . . . . .	23	63.—Hand-leather . . . . .	61
21.—Old Sole Removed . . . . .	24	64.—Shape of Foot Drawn on Paper . . . . .	62
22.—New Sole partly Fitted . . . . .	24	65.—Shoemaker's Tape Measure . . . . .	63
23.—New Sole Fastened in Groove . . . . .	25	66.—Measuring a Stockinged Foot . . . . .	63
24.—New Sole finally Fitted . . . . .	25	67.—Measuring a Last . . . . .	64
25.—Position for Rivets . . . . .	26	68.—A Last . . . . .	64
26.—Edge of Sole Pened . . . . .	26	69.—Bottom of Last . . . . .	65
27.—Shoemaker's Rasp . . . . .	27	70.—Long Leather . . . . .	66
28.—Enlarged View of Pened Work . . . . .	27	71.—Instep Leather . . . . .	66
29.—Top Piece on Heel . . . . .	27	72.—Joint Leather . . . . .	66
30.—Glazing Iron . . . . .	29	73.—Heel-pin . . . . .	66
31.—Leather Skived to form Patch . . . . .	33	74.—Last in Parts . . . . .	67
32.—Putting on a Patch . . . . .	33	75.—Peg-awl . . . . .	67
33.—Patch Completed . . . . .	34	76.—Gent.'s Lace Boot . . . . .	70
34.—How to hold the Boot whilst Sewing . . . . .	35	77.—Oxford Shoe . . . . .	71
35, 36.—Leather Skived to form Patches . . . . .	37	78.—Inner Sole, Filled and Holed . . . . .	72
37.—Preparing the Boot to receive the Patch . . . . .	38	79.—Prick-stitch . . . . .	73
38.—Crack mended with Cross and Zigzag Stitches . . . . .	40	80.—Awl Holing the Inner Sole . . . . .	73
39.—Cross Stitch . . . . .	41	81.—Stiffener . . . . .	74
40.—Blind Stabbing . . . . .	41	82.—Skiving-knife . . . . .	74
41.—Blind Stabbing . . . . .	43	83.—Side Lining . . . . .	74
42.—Upholsterer's Needle . . . . .	42	84.—Ready for Lasting . . . . .	75
43.—Needle in Handle . . . . .	43	85.—Sole of Last showing Tacks . . . . .	76
44.—Maker's Blind Stabbing . . . . .	44	86.—Lasting Tack . . . . .	74
		87.—Lasting the Toe . . . . .	78
		88.—Shoemaker's Pincers . . . . .	79
		89.—Side of Lasted Toe . . . . .	80
		90.—Sewing the Welt . . . . .	84
		91.—Welt enlarged . . . . .	85
		92.—Awl and Bristle . . . . .	86
		93.—Awl and Bristle in . . . . .	87



## LIST OF ILLUSTRATIONS.

	PAGE	FIG.		PAGE
94.—Sole . . . . .	89	139.—Welt-beater . . . . .	122	
95.—Rounding up the Sole . . . . .	90	140.—Corner-beater . . . . .	122	
96.—Channel for the Stitches . . . . .	90	141.—Peening the Heel . . . . .	123	
97.—Channel laid open . . . . .	92	142.—Rasping the Heel . . . . .	129	
98.—Stitching-awl . . . . .	93	143.—Yankee Heel Shave . . . . .	124	
99.—Stitching the Boot . . . . .	94	144.—Peening Edge of Sole . . . . .	125	
100.—Making the Stitch . . . . .	95	145.—Rasping Edge of Sole . . . . .	125	
101.—Rubbing the Channel down . . . . .	96	146.—Sole-plane . . . . .	126	
102.—Sole-piece . . . . .	98	147.—Shoemaker's Buffering . . . . .	126	
103.—Cutting Split-lifts . . . . .	99	knife . . . . .	126	
104.—Turning the Split-lift . . . . .	100	148.—Welt Knife . . . . .	128	
105.—Split-lift in position . . . . .	100	149.—Breasting the Heel and . . . . .	129	
106.—Heel ready for Sewing . . . . .	101	Marking the Waist . . . . .	129	
107.—Flat-waisted Last . . . . .	102	150.—Sole, Waist, and Top- . . . . .	130	
108.—Alteration of Last for . . . . .	103	piece set up . . . . .	130	
High Heels . . . . .	103	151.—Seat-wheel . . . . .	131	
109.—Another way of Altering . . . . .	103	152.—Handle for Waist Iron . . . . .	13	
Last . . . . .	103	made from a chair leg . . . . .	13	
110.—Heels Contrasted . . . . .	104	153.—Hollow Waist-iron . . . . .	132	
111.—Stitching the Lift . . . . .	104	154.—Side-view of Waist-iron . . . . .	132	
112.—Method of Making the . . . . .	104	155.—Round Waist-Iron . . . . .	132	
Stitch . . . . .	104	156.—Blind Double Iron . . . . .	132	
113.—Pening to cover the Stitch . . . . .	106	157.—Double Iron . . . . .	132	
114.—Trimming the Seat . . . . .	106	158, 159.—Forepart Iron: Front . . . . .	133	
115.—Metal Guard used when . . . . .	107	and Side Views . . . . .	133	
Trimming . . . . .	107	160.—Double Iron . . . . .	134	
116.—Seat-breaker . . . . .	107	161.—Improved Fudge-wheel . . . . .	135	
117.—Welt-file . . . . .	108	162.—Portion of Boot for Prick- . . . . .	136	
118.—Pegging a Seat . . . . .	108	ing up the Stitch . . . . .	136	
119.—Seat Sewn for Pegging . . . . .	109	163.—Spirit Lamp for Heating . . . . .	137	
120.—Pegged Seat and Split- . . . . .	109	Irons . . . . .	137	
lift . . . . .	109	164.—Holding Heel-ball Cloth . . . . .	139	
121.—Flexura Spring . . . . .	110	165.—Double-handed Burnisher . . . . .	140	
122.—Inner Sole for Pegged . . . . .	111	or Glazer . . . . .	140	
Waist . . . . .	111	166.—How to Mark Waist . . . . .	141	
123.—Pegged Waist Enlarged . . . . .	112	167.—Creasing for Flexura . . . . .	143	
124.—Split Strip for light . . . . .	113	Waist . . . . .	143	
Pegged Work . . . . .	113	168.—Section of Boot . . . . .	143	
125.—Completing the Heel . . . . .	114	169.—Last Hook . . . . .	144	
126.—Shape of Lifts for Blind- . . . . .	115	170.—Round-headed Peg Rasp . . . . .	145	
ing . . . . .	115	171.—Peg Knife . . . . .	145	
127.—Top Piece Bradded . . . . .	115	172.—Seat-sock for Gent.'s . . . . .	145	
128.—Pitch of Heel . . . . .	116	Boots . . . . .	145	
129.—Heel Pitching on Breast . . . . .	116	173.—Sock for Ladies' Boots . . . . .	146	
130.—Heel Pitching on Back . . . . .	116	and Shoes . . . . .	146	
131.—Correct Range for Spring . . . . .	117	174.—Putting in Sock not to . . . . .	146	
Waist on Last . . . . .	117	Crease it . . . . .	146	
132.—Spring Waist off the Last . . . . .	118	175.—Thin Sheet Iron to cover . . . . .	148	
133.—Square Military Heel . . . . .	118	Last . . . . .	148	
134.—Smart Military Heel . . . . .	118	176.—Boot Bottom with . . . . .	149	
135.—Heel in the Rough . . . . .	120	Blinders and Split-lift . . . . .	149	
136.—Knifing-up the Heel . . . . .	121	on Heel . . . . .	149	
137.—Paring Waist and Buffering . . . . .	121	177.—Boot Lasted Ready for . . . . .	150	
Edge . . . . .	121	Riveting . . . . .	150	
138.—Peening Waist and . . . . .	121	178.—The Riveted Sole . . . . .	151	
Breaking Heel Corners . . . . .	121	179.—Rivet Driver . . . . .	152	

# BOOT MAKING AND MENDING

## CHAPTER I.

### REPAIRING HEELS AND HALF-SOLING.

SOLING and heeling are very necessary operations ; for boots and shoes are amongst the necessities of life, and soles and heels will wear out. A man who does his own repairs at once increases his income, or at least saves a continual outlay.

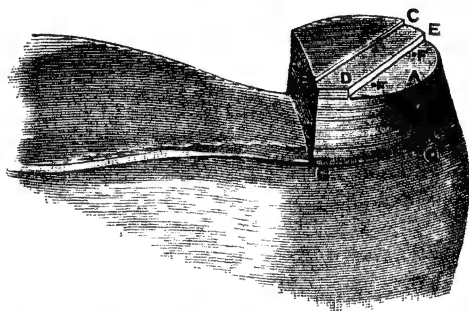
For the processes of heeling and soling, not many tools are needed to start with, and the leather can be bought in small quantities ; and all the necessary grindery (such as rivets, brads, pegs, hemp, paste, etc.) can be bought, also in small quantities, and at a very low rate.

Suppose gentlemen's boots want heeling and soling, the price at which they are done by low-priced repairers is 4s. 6d., and then the work is inferior and the leather nearly always foreign. Though there are some good tannages and parts in foreign stuff, yet low-priced repairers use only what are called first-cuts (the neck end of the butt), which is the lightest leather both in substance and weight, and consequently the cheapest. A pair of soles of this material costs 1/-, the top-pieces for the heel 4d. ; so the leather does not cost more than 1s. 4d. at the most ; and if such material does not last long in wear, it is not surprising. Besides, the soles are often put on badly and with long rivets, so that they cannot be got off again without pulling the boots all to pieces.

There is great importance in keeping heels level, for if they are allowed to wear down low, the evil that is caused is difficult to remedy ; for this not only tends to throw

the heel itself on one side, but also causes the sole to wear away much quicker, runs the stiffener down at *g g* (Fig. 1), and throws the boot or shoe out of position, generally beyond recovery.

Nearly everybody in walking wears down his boot heels at one particular spot. Usually the wear occurs most at *A* (Fig. 1), though with some it is at the back of the heel; while a few wear most on the inside. The repair of these defects is one of the best jobs that a novice at the craft can start upon, as the grafting in half-heeling



**Fig. 1.**—Worn Heel Prepared for Mending.

only means butting the new piece of leather against the old, and there is no play or friction to cause them to come asunder. The leather in very cheap boots and shoes is not properly “worked”, this term meaning wetted, dried, hammered, etc.

This explains why a new pair of cheap boots worn in the wet are, when taken off the feet, lower on one side of the heel than on the other, although the leather is not actually worn away. It is because the unworked leather yields to the pressure caused by the weight of the body in walking, and this yielding is the first stage to ruin. To prevent this, always have a few extra nails put into new boots round the part where most wear occurs.

When the heel is worn down on one side only, it is not necessary to take the whole of the top-piece off, but only

half of it, which can be replaced with any corner of hard sole leather that would be almost useless for any other purpose. To remove half of the top-piece, cut it across at B C, and should the lift be worn, saw or cut that through as well at D E; tack a piece of leather on to take the place of the worn piece of lift, putting the tacks in at F and F. Then trim it round, and put some odd corner of hard sole leather on in like manner, to take the place of the worn part of the top-piece. Trim this also, and nail it as shown in Fig. 2. In this case, four of the rivets

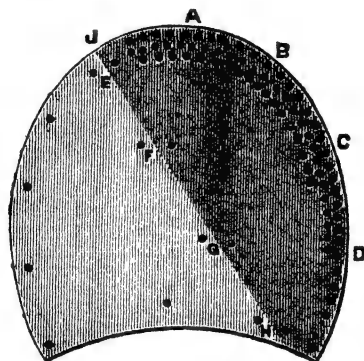


Fig. 2.—New Half Heel with Rivets to Resist Wear.

put in at A, B, C, and D should be quite  $\frac{1}{2}$  in. long, so as to hold the lift as well as the top-piece. One, two, three, or four rows of rivets may be put in near the edge, but they are not much use unless close together. Rivets should be put in as shown at E, F, G, and H. This done, file them up, and finish in the ordinary way. Do not neglect to keep the heel level. This is of special importance to those who mend their own boots.

Half-heeling, with plenty of nails close together, regularly done, will keep boot heels in proper order; but it is not everyone who can spare his boots or who can spare the time to do them properly in this way, and when this job is once started, the boots cannot be worn until

they are finished. It is advisable never to wear a top piece quite through, for the lift is then worn away; and no matter how little this may be, it will need either replacing as described above, or repairing by means of a skived piece of leather put under.

Before letting new heels wear away, take a piece of paper with one straight line and lay this across the heel, from J to H (Fig. 2); hold it with two fingers of the left hand quite firm at F and G; then with the right hand smooth it down over the edge from J, passing A, B, C, and D on to I; this will leave a mark on the paper. Cut out to this mark, and it will give a good pattern of a half-heel piece, as Fig. 3, without the outside line A. To this cut another pattern out of stiff cardboard, as it will very often be wanted for use.

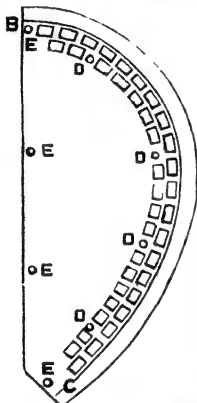


Fig. 3.—Half-Heel Piece Holed and Hammered.

When leisure occurs cut sole leather to pieces of this pattern, leaving  $\frac{1}{4}$  in. on all round the curved side A (Fig. 3), to give room for nailing. Here it will be necessary to explain how to make an awl for this purpose, as, unlike all other awls, such awls cannot be bought ready for use, but it is a tool that saves much time and disappointment.

To make this tool, an ordinary handle is used for a peg-awl, A (Fig. 4); two pieces of sole leather are put on top, as B and C. To secure these, put one short stout screw in the centre, and then put a third piece on, as D, first cutting a hole in the centre, a little larger than the head of the screw, as A (Fig. 5), and then put about five rivets in, as B, C, D, E, and F. This is done because the awl, when finished, is very stumpy, and requires such hard blows to get it in that these would split the wood; but by means of the leather this is avoided, and the hole in the centre will admit of tightening the screw when

necessary. The edge is trimmed up all round, and a carpenter's large bradawl is put into the other end. This awl has a shoulder to it, therefore the heavy blows will not drive it into the handle. When the awl has been

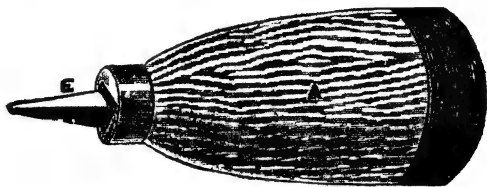


Fig. 4.—Home-made Awl.

put into the handle, break it off to about an inch from the shoulder; then with a fine file, or on a grindstone, taper it to a long, flat, square point, as *E* (Fig. 4); it should be the shape of a French brad (Fig. 7), only about  $\frac{1}{4}$  in. longer, and, of course, smooth.

The piece of leather in Fig. 3 should be of good

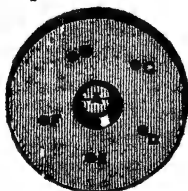


Fig 5.—Top of Awl Handle.



Fig. 6.—  
Cut Bill.



Fig. 7.—  
French Brad.

substance, and should be wet, but not soddened. On it mark a line round the curved line from *B* to *C*,  $\frac{1}{4}$  in. from the edge, and from these two points make two rows of holes with the awl just described, which should be dipped into a piece of soap each time before using. A hole can be missed in the second line of holes at each of the four places *D*, *D*, *D*, *D*, and a small round hole made instead, and four more also made at *E*, *E*, *E*, *E*; then let the leather get nearly dry before hammering it. This hammering will make the holes smaller and more

irregular-looking than shown in Fig. 3; but this does no harm, for so long as the awl is held in the same position for each hole, the brads are sure to follow into their proper places.

It has been stated above that the awl should be of the same shape as a French brad, which is shown in Fig. 7; but there is another kind of brad of similar shape, only it is much shorter and a little stouter, as shown in Fig. 6. This is called a cut-bill, and it is this brad that must be used to put into the holes made in Fig. 3. Let the length of the brads be as nearly equal to the substance of the leather as possible; lay the leather upon a piece of wood, and knock the brads in the square holes one at a time. When they are all in, take the leather off the wood, and lay it on the lap-iron with the points of the brads upwards. These, if they are not too far through, can be clenched and made smooth by tapping with a hammer; but if they are through far before trying to clench them, they must be cut off with a pair of cutting tongs close to the leather.

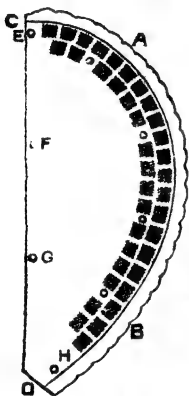


Fig. 8.—Half-Heel Piece Bradded.

This done, the half-heel is ready for use. Several may be prepared, and then all that is necessary to half-heel the boots is to cut the top-piece across, as shown, from J to H (Fig. 2), take away the worn part, and replace it with the new piece. Fig. 8 shows where it should be bradded, and also the places for eight  $\frac{1}{4}$  in. rivets; these are all that is necessary to hold the piece on, and will allow it be taken off easily when another heel-piece is wanted.

It will be found that the small margin, A B (Fig. 8), after the brads have been put in, has become somewhat contracted. This is why the extra  $\frac{1}{4}$  in. of leather was left, for it would break if nailed close to the edge. Now

you can trim up the edge of the piece to the edge of the heel, cutting close to the brads, on the line c to d, and finish in the ordinary way. The first time the boots are half-heeled, it will be necessary to put four rivets in the old leather at e, f, g, and h (Fig. 8), to keep it from ripping off.

Another good and easy way to half-heel boots is to get a pair of Snow's patent leather-plugged half-tips (Fig.

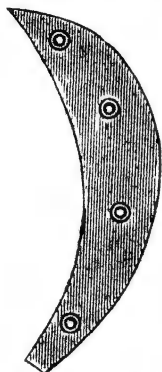


Fig. 9.—Snow's Leather-plugged Half-tip.

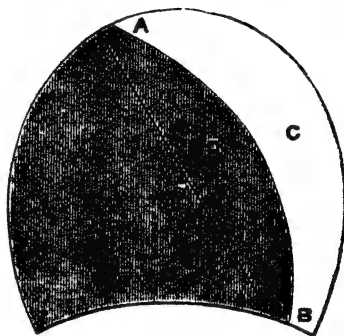


Fig. 10.—Heel Prepared for Half-tip.

9), price 1d. Put one on the heel in its proper position, mark round the inside from A to B (Fig. 10), and cut away the part, c, that the tip is going to replace. Lay the tip on the lap-iron face down, and hollow it in the centre, that it may grip well at both ends, then dip it in water to soften the leather plugs, and put it on the heel. With a fine awl make a hole through the centre of each plug, and put a long rivet, which would be supplied with the tips, in each hole. Smooth it up with a file where rough, and you have a new lease of heel wear for 3d., and a very little trouble. If it is found difficult to cut the curved line to fit the tip from A and a, cut the heel straight across, as in Fig. 2, from J to H, and after the tip is on cut a small piece, as D (Fig 10),



and nail it in with four rivets. To get D the proper shape, let it have one straight side, and press that against the old leather. Hammer the leather on the tip—this will make a mark underneath—cut through this line, and you have the shape required.

Perhaps it is well to mention here that for beginners heeling and underlaying—that is, placing pieces under the soles—is better work to start upon, as by such work the use of the tools will be gradually acquired, and sufficient skill obtained to warrant attempting the harder task of soling and heeling throughout.

Suppose, as is often the case, your boots want the heels set up on one side only, and a piece is wanted

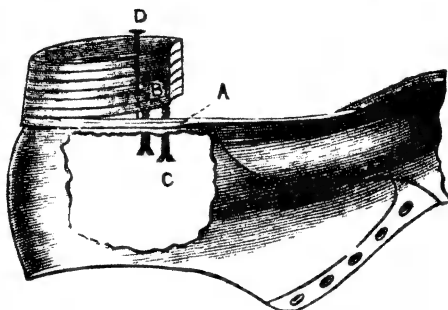


Fig. 11.—Fixing Heel with Screws.

under the side of the soles, or a toe-piece is wanted. A job like this can be done with very few tools. But it is well always to buy a tool when you want it, and always to try and do the work as well as possible; for by taking pains with the work, you will soon be making progress. Boot repairing comes under every man's notice, so he has some idea how it should look when finished.

In the case of a heel that has given way by parting from the shoe, the best way to repair it is to bore two holes from inside the shoe, each large enough to admit a joiner's screw to pass through, as at A in Fig. 11, and then make two small holes into the heel at B, as a lead for

the screws, which can be about  $\frac{1}{2}$  in. or 1 in. long. From the inside screw the two well into the heel, as at c; then put the shoe on an iron foot, and drive in a long French nail from the top, just behind the screws, as at d, and the heel will be as solid as it was at first. Perhaps, by putting in another screw the nail may be



Fig. 12.—Sharpening Strop.

dispensed with, and if so, so much the better. as then nothing of the repair can be seen from the outside.

A sharpening strop (Fig. 12) is indispensable to the shoemaker. It is generally a solid piece of square wood, about 18 in. long, shaped at one end to form the handle, A, about 4 in. long. A useful hollow one may be made in this way: Take four pieces of wood,  $\frac{1}{4}$  in. thick, 12 in. long, and about  $1\frac{1}{2}$  in. wide: place them together, as shown at Fig. 13, and fix them with screws, illustrated at B, B, B, B. Then cut a square piece, as C, and fix it with two French nails at each side, as D D

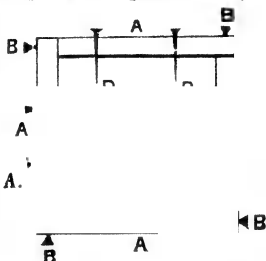


Fig. 13.—End View of Strop.

(Fig. 13). Then have a square piece of wood, the same substance, about 6 in. long, and shape it for the handle, as A (Fig. 12), leaving about 2 in. square to form a stopper for the square case, which will be found very handy to keep spare awls in and also broken awls, the use of which will be explained later on. It is also very convenient to keep a sharp knife in, for if left with other tools, this gets blunt, and when picking up another tool, you are apt to cut your hand if the knife is lying on the bench.

When the strop has been completed, as shown in Fig. 12, paste a piece of leather on one side, and on the

other three sides paste emery-cloth, Nos.  $1\frac{1}{2}$ , 1, and F F. For putting a fine edge to the knife use the F F, dip the blade of the knife in water, and finish on the leather side. In sharpening a knife, always hold the blade quite flat on the strop, or you will produce a round edge, which makes it hard to use.

Paste is very often wanted. A small quantity can be bought at any grindery shop. But it soon gets dry, and some of it is sure to be wasted. The better way is to make paste thus: put a table-spoonful of rye-flour into a jar, add a little *boiling* water to it, and well stir; this is economical, and you can always have paste in a few minutes.

To sole and heel a pair of boots, procure a pair of soles of English tannage, costing from 1s. 10d., and top-pieces from 9d.; iron rivets at 4d. lb.:  $\frac{1}{2}$  in. is a very useful size; sand-paper, 1 sheet, size  $1\frac{1}{2}$ , cost 1d.; and shoemakers' ink, 2d. A better sole would not be got at many full-priced shops.

Most important and most needed tools are an iron foot (Fig. 17), a shoemaker's hammer, knife (Fig. 82), nippers, glazing iron (Fig. 30), and rasp (Fig. 27). This list of tools does not include sufficient to turn out all kinds of work properly, but the number is cut down so that the first four or five repairing jobs, including tools, shall cost no more than if they had been done by an ordinary repairer.

Now we have leather and tools, we will start work. If you sit on an ordinary chair, it should be cut down to about 14 in.; or any seat that height will do. Your tools, for the present, can be put on the floor or on the box you keep them in; but a shoemaker's bench is of course better.

The illustration Fig. 14 shows that it is not very hard to construct a shoemaker's bench, though, if the one shown is too elaborate, the drawers can be dispensed with. Even a sugar-box will suffice, taking the lid off and laying it on its side, the open top being A, where one or ever more drawers can be made to fit in. The

lid will make the back, and the beads for the two sides and front marked *B B B* and *B*, which are about  $1\frac{1}{2}$  in. above the side of the box. Compartments can be made at *c c* to receive the grindery in use, one especially to fit the ink-bottle, that it may not get knocked over.

To tell a hand-sewn boot from one that is machine-sewn, first take the sock out, and if there are stitches all round inside, on the inner sole, the boots are machine-sewn. If the inner sole is smooth, they are either hand

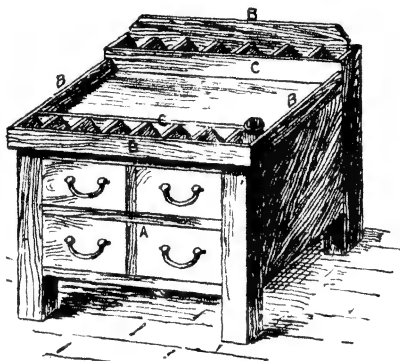


fig. 14.—Shoemaker's Bench.

sewn, standard-screw, or a combination. If they are standard-screw, the marks of a small round disc show on the inner sole. The screw wire is put in so that it seldom shows on the inside, but if the centre of this impression is scraped away, the brass screw wire will be brought to light and prove the make. A machine-sewn welt (the nearest approach to hand-sewn) will show a real and good stitch all round the outside. Machine-sewn boots or shoes are much heavier than hand-sewn. Another guide is the inside of the heel, for generally machine-sewn boots have heels that are put on by a heeling machine, in which you can see either the heads or clenched points on the inner sole of the seat. Or the heels are nailed on by hand, which can be told

in the same way. For this reason machine-made boots often have a whole or half inner sole in them, but if this is taken out it can soon be replaced. Men who do hand-sewn work do not build theirs in this way, for if not sewn they are pegged.

Now to sole and heel a pair of riveted or machine-sewn boots, which require new soles to be riveted on. First dip into water the old soles and heels of the boots and hold them in for a few minutes; let them dry a

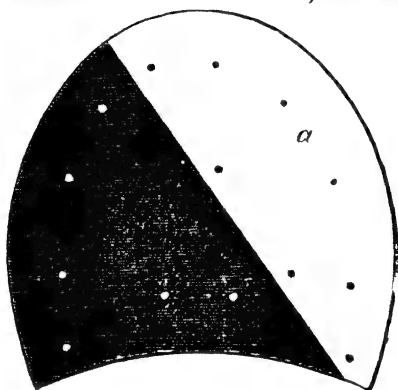


Fig. 15.—Heel prepared for Repairing.

little, so as to have them just mellow. The new leather must be put in water, and thoroughly wetted through; then taken out, and allowed to get nearly dry, but not by the fire, if this can be helped. Rasp off all rough flaky stuff from the flesh side. Place the lap-iron—which is simply a laundress's iron with the handle off—on your thighs, just above the knees, put the leather on it, grain side down, and, commencing from the centre, hammer it well, evenly and gently. This makes the leather more dense and more resistive to wear, and also more impervious to dampness. While the leather dries, take off the old top-pieces that are worn, and if the lifts are worn, cut or saw them through the centre, and take away the portion that is worn, as *a* (Fig. 15).

This can then be replaced by a piece of new leather, which need not be of the best quality. There are other ways of building up heels, which will be explained as we make progress.

This operation of taking off the old soles requires some care. If the boots are wetted, they are far less likely to fall to pieces and otherwise give trouble than if they are worked upon in a dry state. When taking off the sole, a last can be put in the boot, to make a solid foundation to work on; the old sole can be prised off with a blunt chisel when it is wet, commencing at the toe or the thinnest part; this will enable you to catch hold of it with

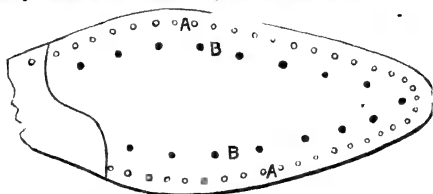


Fig. 16.—Rivets in a Boot Sole.

nippers. By means of these pull off the sole with the nippers in one hand, and at the same time hold down with the other the under leather (often termed welt, or runner). Should the under part still have a tendency to give way from the uppers, knock back the sole, so that it leaves the rivets sticking out; with the pincers or nippers pull out the rivets, and repeat the processes till the sole is got off without disturbing the boot. Before putting the new sole on, the under part can be nailed down with a few short rivets to make it solid. If in the making or previous repairing very long rivets have been used, taking off the sole will need great care to avoid causing the boot to fall to pieces. As your own repairer, never let your boots wear low, for here "a stitch in time saves nine"; and the cheaper the boots, the more applicable this adage.

For re-soling machine sewn boots and shoes, follow the advice given in connection with hand-sewn work.

The following is another system for sewn work :—When the lasts are in, and the boots wet, skive off the edge of the sole : not right through, or you may spoil the welt, but deep enough to cut through the stitches and cut their loops off. Then, as before, the toe can be raised or prised up from the welt, when taking off the sole is an easy matter.

If the under-sole should come away whilst taking off the outer one, the damage must be made good. This



Fig. 17.—Iron Foot used in Re-Soling.

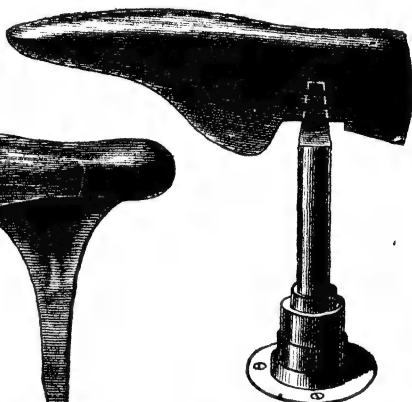


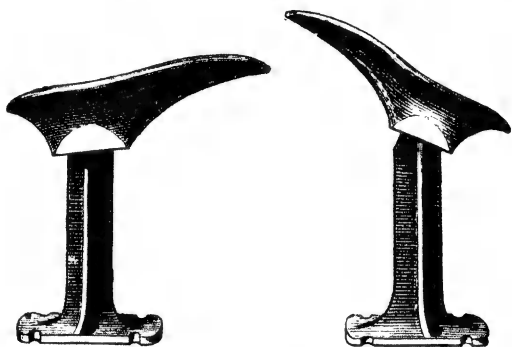
Fig. 18.—Iron Last and Stand.

can be done in the following manner :—If you are repairing on an iron last or an iron-bottom last, hammer the middle or under-sole back into its place, first taking out all the old nails ; then, supposing *A A* in Fig. 16 to show the line where the rivets which fix the new sole will pass through the middle sole, put through the line *B B* a few short rivets or long tingles, according to the substance of the bottom. The dots, *B B*, show where the tingles should be put. They should be only just long enough to clench on the bottom of the last.

When repairing on a wooden last, and this under-sole is being fixed, take the shoe off and slip it on the

iron foot to clench the tingles, for they must be clenched before the new sole is put on. When putting the new sole on and knocking in the rivets, put extra long ones in, say an inch apart : just long enough to clench through the whole thickness of the new sole, middle sole, tops, inner sole, etc. The long rivets should be of brass, so that when the shoe is again re-soled these will draw out with the thin old sole, and not disturb the middle sole in so doing.

The cause of boots falling to pieces, as they some-



Figs. 19, 20.—Last Stands, with Reversible Foot.

times do after a short period of wear, is frequently the want of a good solid inner sole. If not gone too far, and if when pulling the sole off the boots are not pulled to pieces, remedy this defect by putting a new half inner sole in the forepart, and then re-sole the boots on the iron foot. If they are past this, and the uppers are good enough, re-last the forepart on a pair of iron lasts or a pair of iron-plated ones.

To obtain the required lasts, the size of foot must be taken in inches. Draw the tape measure just a little tighter than you would like the boot, and then send off the order thus : 1 pr. gent's (boot or shoe) lasts, joint 9 in., instep  $9\frac{1}{2}$  in., as the case may be. Iron-plated ones are the cheaper, as iron stem and stand, which



cost 3s., are wanted with the iron lasts; but an iron-plated last, screwed to a bench, gives you the advantage of being able to stand at work. Figs. 17 and 18 show last and stand, which can be got at any leather warehouse.

Figs. 19 and 20 show a useful stand for repairing purposes which allows the foot to be fixed firmly in either of the two positions.

The old sole should be cut off at the waist to within

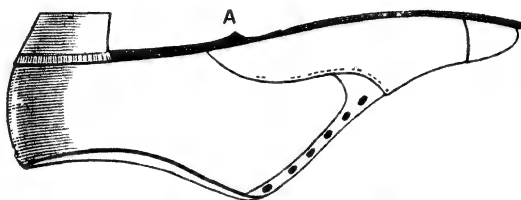


Fig. 21.—Old Sole Removed.

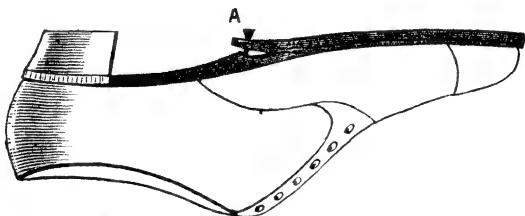


Fig. 22.—New Sole partly Fitted.

about  $\frac{1}{2}$  in. from where the new sole is to come. Mark off the exact length of the new sole, and then start to skive off from this mark, tapered to where the old sole was cut off. From the line scoop it out evenly with a knife, until about one-third of the way through (as A, in Fig. 21). Then lightly tap down the leather, right across where hollowed out; this should be done with the pene end of the hammer. This process hardens the leather to receive the pegs or rivets and, without weakening the old leather, gives an extra drop to receive the new sole. The new sole to be spliced to this part of the waist of the boot must be skived, but not very thin; and

it is best to skive on the flesh side for light work, and on the grain side for heavy work. Slightly paste the groove in the old leather, and also the new sole, where it has been skived; this tends to make the graft sound and firm when finished. It is all important to properly work the leather before using—that is, by wetting, fleshing, drying, and hammering, as explained on p. 20.

In levelling up for re-soling, the proper way is to

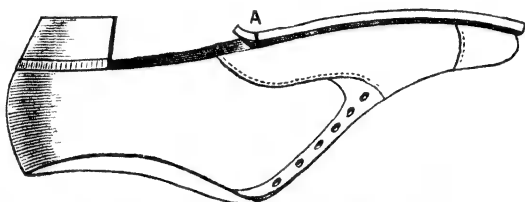


Fig. 23.—New Sole Fastened in Groove.

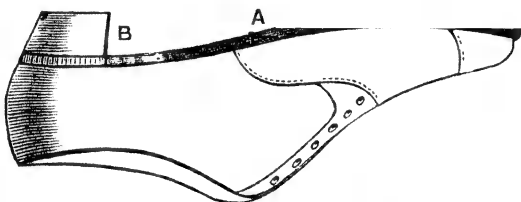


Fig. 24.—New Sole finally Fitted.

make the sole just a little rounded, putting in just enough filling to make this difference. The bottom of a boot, if too round, is sometimes uncomfortable, and wears away quickly, whilst one hollow in the centre is uncomfortable and unsolid. A last should be somewhat round at the bottom, so that it fits the bottom or sole of the foot. The sole of the boot will be made round enough by placing a layer of felt in the middle, to prevent creaking, and make it impervious to dampness as far as possible. This applies both to making and to repairing.

To fix on the new sole, place the boot or shoe on an

iron foot. The sole should be put on with the skived end to overlap the groove about  $\frac{1}{4}$  in., as shown at A (Fig. 22). When riveted, it should be well into the groove, as shown at A (Fig. 23). If the graft is well done,

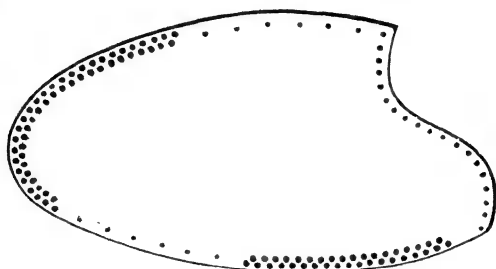


Fig. 25.—Position for Rivets.

the end of the new sole will project above the old leather. This part must be pared off neatly level with the waist, then pened with the hammer and rasped off. When all these processes are carried out, you will have

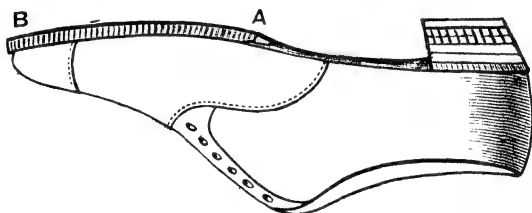


Fig. 26.—Edge of Sole Pened.

a neat and a permanently solid seam, as shown at A (Fig. 24).

Before putting in the rivets, pare up the sole—not closely, but leaving a small margin all round. About  $\frac{1}{4}$  in. from the edge, draw a line all round with a pair of compasses or with a pencil, which will answer the purpose, held between the thumb and finger, placing the second finger against the edge of the sole. Then with an awl prick on the line, all round the sole, small holes

to receive the rivets, putting them closest where most wear comes ; generally, this is at the toe and outside

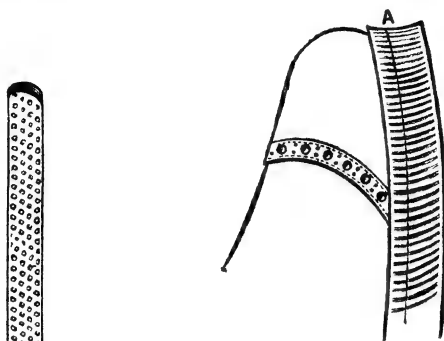


Fig. 28.—Enlarged View of Pened Work.



Fig. 27.—Shoe-maker's Rasp.

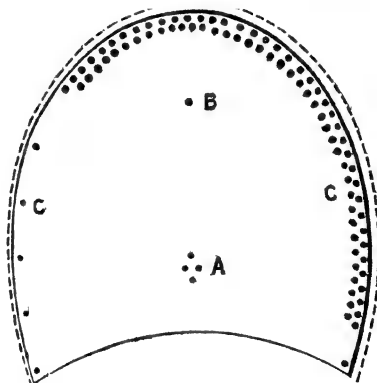


Fig. 29.—Top Piece on Heel.

joint, where it is best to use iron rivets ; elsewhere brass rivets should be used. Fig. 25 shows about the form in which the rivets should be put in.

Trim up the sole's edge with the knife, being very careful not to cut the uppers ; then damp the edge, and

pene it all round with the hammer. This should be done with the shoe on the knees, the heel being towards you and the edge of the sole upwards, and pene by hammering, as shown in Fig. 26 at A B, commencing at A, and going right round the sole. This process is important, as it hardens the edge, tends to make it hollow, and prepares it to receive the next tool, which is the rasp (Fig. 27). The toe end of a shoe is illustrated on a larger scale at Fig. 28, which shows how the pening strokes should be laid to weld the new and old leather together, and keep the edge hollow, as at A (Fig. 28). Then let the whole boot dry, while you proceed with the other one.

When you repair your own boots, never let the heels wear more than just through the top-piece: then the heels keep in shape; but if you have to repair the lifts when putting the pieces on, let the nails be a little way from the edge, or when the top-piece is nailed on one set of nails will come in contact with those below, and produce unpleasant results. When building up the heel, ready for the top-piece, it is well to make that side where the most wear is a little higher, as it tends to make the wear more even. Tack the top-piece on the heel (Fig. 29), putting a nail at A and one at B, and round it up with the knife, leaving a little stuff on all round, more particularly at that part which is to receive the most nails, as shown by the dotted line. The rivets should then be put in, as shown at C C, but first mark round the heel and hole it, as was done for the sole, then pare and pene, as described above; the edges of the soles and heels should then be rasped, then buffed with a scraper or buffing-knife.

This tool, which is illustrated on p. 126, is similar to a cabinet-maker's scraper, and it can be made of about 3 in. of old stay-busk. Such a tool can be bought, but it is seldom ready for use, so you might as well make one; and a piece of freshly-broken glass will suffice. Then sand-paper the edges with a piece of No. 1½ sand-paper. The faces of the sole and heel can be filed with the file

side of the rasp, to make the heads of the rivets smooth and even with the leather ; then buff off the grain of the leather with the scraper, and sand-paper the sole all over. This produces what is called a rough bottom, and all that is needed for own work. Rub a little paste on the edges with a piece of rag, and ink the edges and the waist, using shoemaker's ink, American is best. This is allowed to get just dry, then the leather is rubbed over with the glazing-iron (Fig. 30). This iron must not be very hot ; its proper heat is such that if it is put into water it should just cause a hiss. Properly, a forepart iron should be used for the soles, but the glazer will do for a makeshift. This ironing process gives a nice gloss, which is increased and made more permanent by being repeated, at the same time ironing on a thin coat of heel-ball, which can be rubbed off smooth with a piece of old cloth, and will leave a brilliant polish.

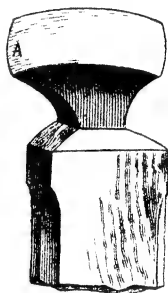


Fig. 30.—Glazing Iron.

Always remember that any job in repairing can be finished much better if a last is inside the boot ; and that pening, rasping, buffing, and all finishing, should be commenced from A for the soles (Fig. 26), and from B (Fig. 24) for the heels. In using the knife, the action is the reverse in both cases.

Gutta-percha makes by no means bad soles, and with it no great difficulty will be found in either patching or entirely re-soling boots. It is not recommended for use on neat light boots ; but many an old pair of boots which are looked on as past wear can thus be made thoroughly useful for winter wear ; for it must be remembered that gutta-percha is waterproof. It is also light in weight, and is warm to the feet. It is, however, chiefly on the grounds of economy and the ease with which it can be used that gutta-percha is to be recommended.

The gutta-percha necessary can be got at any india-rubber shop. It is sold in pieces about  $\frac{1}{2}$  in. thick, and

only as much as may be wanted need be bought. The measurement roughly can easily be got. Some cement will also be required; that used for fastening the india-rubber tyres on cycles, etc., is excellent for the purpose. Cuttings of gutta-percha could be used instead, but would not be found so satisfactory, except perhaps to stick a patch on a worn piece of gutta-percha sole. In this case, though, a cement of any kind is hardly necessary, as the two surfaces on being made sticky by heat, will adhere without a medium.

The soles to be repaired must be thoroughly dry before commencing operations; for if they be in the slightest degree damp, the new soles, though they may adhere for a time, will certainly come off ere long. That any dirt or clay must be cleaned off, goes without saying. It may be advisable to tear off the bottom layer of leather, in which case a neater-looking job perhaps will result; or you may just take the boot as it is, and lay the gutta-percha on. In either case, the work is the same. It is well to heat the soles of the boots and put the cement on while they are warm. The cement may be melted either in a ladle and poured on, spreading it thinly, or be used like sealing-wax by melting it as required and rubbing it on the boot; or pieces may be put on the boot and melted, and spread with a piece of hot iron—the kitchen poker, an old knife, or anything of the kind will do very well. Perhaps this last method is the best, as the hot iron seems to work the cement well into the leather, which, by the way, may first be roughened with advantage by rasping; or even scoring and scratching with a knife will suffice.

When cement is used it should be evenly spread upon the leather, and while hot it is extremely tenacious. If it gets cold before the gutta-percha is ready to apply, it may be heated by the hot iron or over a gas or lamp flame, or at the fire. The great thing is to bring the gutta-percha and the boots in contact while the cement is quite hot. The gutta-percha also should be hot: on the side of adherence hot enough to be soft

and sticky. This can easily be managed by holding it close to the fire for a short time just before putting it on the boot. The gutta-percha should then be firmly, but gently, pressed to the boot. It will be flexible enough to yield to pressure and follow the curve of the sole if it has been sufficiently warmed.

When the new sole is firm and hard—as it will soon become if the boot is put in a cool place—the edges may be trimmed off. This can be done with a knife, as the gutta-percha can be easily cut. The cuttings should be kept, as they come in useful for re-patching the sole as it becomes worn in places, so that there need be little, if any, waste. The final touches may be given by drawing a hot iron of any kind over the edges, so as to smooth them down.

The sole as now made will wear a considerable time, though not so long as leather, but the wear-resisting qualities of gutta-percha may be much increased by the use of boot protectors. These are small pieces of iron for fastening on to the sole in parts most susceptible to wear. They can easily be fixed. The caution that boots with gutta-percha soles should not be placed too near a fire may not be unnecessary, but beyond this, no special precaution is necessary any more than in the case of leather.

Briefly stated, the cost of the tools mentioned in this chapter is as follows:—An iron foot may be bought at 3d. per lb., and a handle or peg for 8d., or a “handy three feet” for repairs, 2s. 6d. to 4s. A shoemaker’s knife costs from 8d., a hammer from 1s. 6d., nippers from 1s. 6d., glazing iron 1s. 6d., and a forepart iron 1s. 6d. These may be obtained at any grindery shop.



## CHAPTER II.

### PATCHING BOOTS AND SHOES.

It often happens that the uppers of boots or shoes want some repairing, such as stitching or patching. An explanation of some of the principal methods of repairing defects in the uppers, with the way also of fastening down to the sole such patches as need it, will therefore be useful. The patch can be fastened down to the sole by sewing; but if the boot has to be soled, and it is not hand-sewn, the sole (or welt, as the underneath sole is termed in machine-sewn boots) can be prised from the upper where the patch is coming, and the patch tucked under, as the original leather is. When it is smooth, with no fulness, the under sole can be tacked down with a few small tacks, to secure it till the sole is put on. A few rivets (say, every alternate one at this part) longer than those used to nail the sole on with will make the boot as solid as it was at first.

Perhaps the neatest and most solid way to put on a patch is to close it in. This is done by cutting away the worn or cracked part of the old leather, as shown on p. 33 (Fig. 32). The cut should not have more curve than is necessary, for the straighter the cut from B to C, the easier will it be to sew in the patch. In cutting out the piece, be careful not to cut the lining; doing so would put an unnecessary strain on the patch, as it would then be left without protection against stress in wear. Cut the piece away at the bottom close to the sole. Select a piece of new leather of good quality; if the old leather is calf, use calf again; if it is horse, or porpoise, use calf also, as near the same substance as possible. For any other kind of leather, such as kid, patent, etc., the patch should match. Lay the patch cut out upon the new leather, and cut the piece full large, as shown by Fig 31; if it is to

be tucked under it will need to be the full size shown ; but if it is to be sewn down, it will only want to be as large as the dotted line in the figure. It will be noticed



Fig. 31.—Leather Skived to form Patch.

that the new piece has not quite so much curve as the old. This is to give a fulness to the patch equal to that which the foot has made in the old leather. The cut

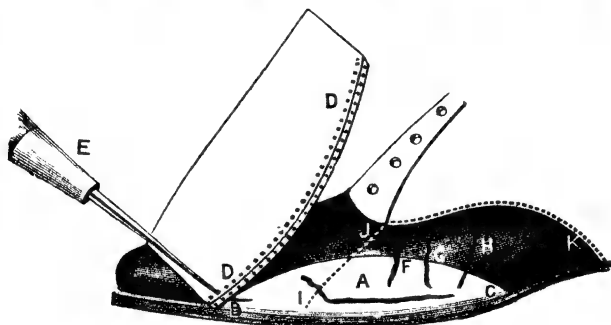


Fig. 32.—Putting on a Patch.

from A to B must be even and smooth, and holes must be made on the wrong side, as shown in Fig. 32 at D D. Place the patch face down on a board, and at about  $\frac{1}{16}$ th in. from the edge make a hole with a closing-awl, E (Fig. 32), letting the point come out in the thickness of the patch as near to the face side as possible without actually going through. Similar holes are made the whole way round the curved edge, putting about fourteen stitches to the inch.

The patch can now be closed to the boot, first slightly wetting the edge of the old leather. Do not start to sew

quite at the end of the new leather, or, when turned over, it will be deficient at the corner. The awl must be put right through the old leather, near to the edge so as not to make a hard seam.

For calf or any stout leather, the wax-end or thread will be made with three strands of fine flax, and have bristles on each end. The way to make threads is explained on p. 60. For kid, or any light leather, twist or stoutish black thread will do ; a tapered end is easily made to either of these by untwisting it for about an inch and a half, scraping it gently between the

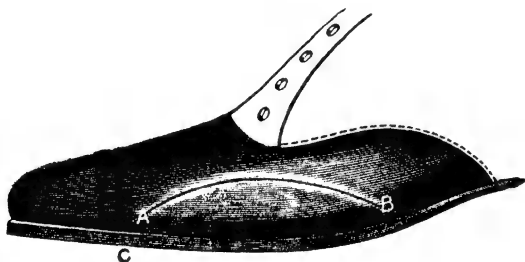


Fig. 33.—Patch completed.

thumb and a blunt knife. Then wet or wax the thread, and twist it back, holding each one separately in the left hand about four inches down, and with the right hand twist the end on the right knee—not too hard, or you may twist off the fine taper that is wanted to receive the bristle.

In stitching this patch, as in all stitching or sewing, each stitch should have the same tension put upon it, at the same time being careful not to pull too hard on the stitch that is to lie on the old leather.

When the patch is sewn right across, again wet it, and scrape off the rough edge, rub it down, and turn the patch on its right side. Put a last inside the boot, and rub the seam down lightly, but well, on the right side. This can be done with the handle of a table-knife, or anything hard and smooth.

Should the vamp be cracked in several places, as *F*, *G*, and *H* (Fig. 32), then it will be best to put in a new wing. It can be closed in from *I* to *J* as described above, and blind-stabbed from *J* to *K*. In a case like this, it is well to have the top edge a little larger all round, to hide the old holes, and, if it is not a leather

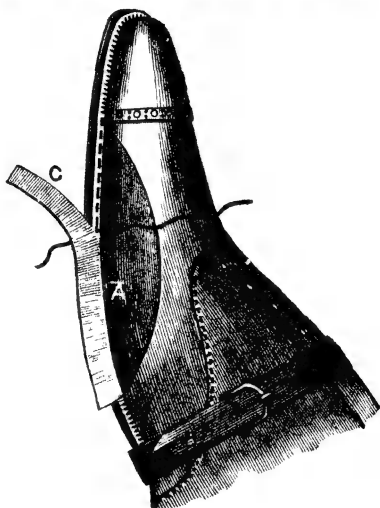


Fig. 34.—How to hold the Boot whilst Sewing.

that has the grain side out, at this part it must be skived on the wrong side a little thinner, about  $\frac{1}{4}$  in. wide. After this kind of seam is rubbed down, it will be made much neater if lightly buffed, or scraped, across from *A* to *B* (Fig. 33), and then rubbed down again. If this sort of patch is put on well, it can scarcely be seen after the boot has been blackened and shined.

Previous to sewing the patch down to the sole, the crevice where the old piece was cut off must be slightly opened with a chisel, or piece of tapered wood or bone and the patch tucked in, as shown at *A* (Fig. 34). This is to enable the stitches to be got as far back and as

much out of sight as possible in sewing the patch down. For sewing the patch to the sole, a sewing-awl must be used: it is similar to the closing-awl, only it has a stouter and wider blade.

The thread for ordinary work will be about ten cord, or No. 9 Patent (price, 10d. per ball), and the awl, although it has to carry the two ends, should only be the substance of one.

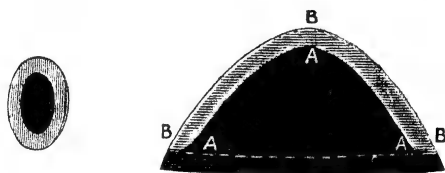
The boot is laid upon the knees, patch side up, and when the piece is on the side shown in the figures, the boot must lay on the lap, toe from you. It must be held very firmly on the knees by means of a strap or stout piece of cord placed round it, as B (Fig. 34), and passing under the ball of the foot. By this means the boot can be held as tightly as you please by simply pressing down the toe.

The stitching must be started from A (Fig. 33), the point of the awl being put in on the welt side, A, and pushed through the sole to the bottom, wriggling the awl a little, that it may find or make its own way through at c. In all sewing, stitching, or stabbing, the bristle on the left side is put in first, and the one on the right side is put in underneath it, so that when the stitch is set it shall be between the thread (on the right side) and the patch. This will help to lay the stitch back, and will make the stitches look even and lay flat. The stitching must be continued right across to B (Fig. 33), setting about five stitches to the inch, and tucking the patch well under before each stitch is taken.

This stitching done, and the ends of threads cut off, the stitches must be rubbed down with the bone on the patch side, and lightly hammered down on the sole side. The surplus of the patch can now be cut off level to the edge of the sole, as shown at c (Fig. 34). The edge can be blacked with ink or blacking, and then rubbed down. A little weak paste on the patch will, if let dry, make it smooth to receive the blacking, and the whole, when blackened and polished, will be a neat and a very solid seam.

The neatest patching is called "Invisible," and this is stuck on with a solution of gutta-percha. Its solvent has an unpleasant smell, but it evaporates very quickly. This solution can be bought at 4d. per bottle, and when not in use it must be kept well corked. Warman's has a scent mixed with it, so it does not smell quite so bad; but Sand's is preferable, for quality if not for smell. Both can be got at most leather-sellers' or grindery shops.

To fit the new patch on the old leather, it is of all importance to have a last, boot-stretcher, tree, or some such thing in the boot, so that the part to be operated



Figs. 35, 36.—Leather Skived to form Patches.

on may be quite solid. Skiving is the principal feature in invisible patches, for it is fitting the piece to a nicety that makes the patch invisible.

Skiving is a process so essential, that all who do not know how to do it well are advised to try their hand at it as much as possible with a sharp knife, using any old odd piece of upper leather, on a piece of smooth marble or board. Skiving means making a tapered edge to the leather on one side or the other. Further instructions on skiving are given on p. 45.

The safest way to get the patch the right size is to cut a piece of paper about  $\frac{1}{4}$  in. larger all round than is necessary to cover the worn or cracked parts. This is to admit of the skiving. Then, seeing that this is of good shape, cut the patch of new leather to it. This should be calf for calf, kid for kid, etc. Kid is a leather that has the grain side for the face, and must not be scraped. Calf may be, as the grain side is the wrong side, and the

flesh the face. After the patch has been cut out to shape (Figs. 35 and 36), proceed to skive the edge. Skive all round if oval (Fig. 35), and round the curve only if semi-circular (Fig. 36). It should be skived from the letters **A A A** to the edge **B B B**, and at this part it should be skived to nothing.

The difference between invisible patches and those to be closed in is that in the former the new patch is cut first, and the old leather fitted to it afterwards, and

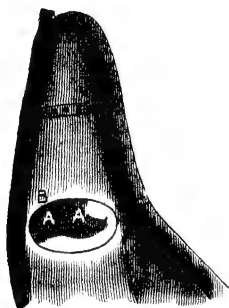


Fig. 37.—Preparing the Boot to receive the Patch.

the old leather is not taken away, as for closing in. In this instance, it will only be necessary to explain how to put on the oval patch, for the rule is the same in all other shapes, except where the patch has to be sewn down to the sole; and instructions for doing this are given on p. 35. When the patch is skived, lay it on the boot, overlapping the worn part equally all round, as **A A** (Fig. 37). Now chalk all round the edge of the patch, and on the old leather as well, as shown at **B**,

and mark the patch and the old leather so as to get the patch back into its proper position.

Then skive the surface of the old leather to receive the patch, starting at the edge of the chalk mark, and skive towards the centre all round, being careful to get the work regular. Then roughen both the new and old leather with either a file, a piece of coarse sand-paper, or a buffing-knife. Lightly brush out all the leather dust, and apply the solution with the finger; shake the bottle, and give one thin coat both to the patch and old leather; let them dry, and then give another thin coat, and let this dry. It should dry white; and if it does not do so, a little more solution is needed. Care should be taken to see that the edge of the patch has taken the solution properly, and that the old leather has it only on

the roughened part. It may be considered that it would be best to solution a patch like Fig. 35 all over, but it is not so, as this would make it very stiff, so that it would not yield in wear, but perhaps only wrinkle and soon work off. The whole of the solutioned surface having dried white, warm both parts before a very slow fire, and when the whole of the white colour has changed to brown, stick the patch on the boot, just as it was first fitted; press it on tight, and with a warm iron spread a little soft heel-ball all over; let the whole get quite cold, then gently rub off the heel-ball, smooth with a cloth, and polish with blacking, and it is finished.

If "Warman's Solution" is used, it will be found better to keep it in a warm place. Some shoemakers, when using this preparation, place the bottle about their person; this keeps it in good working condition: the heat from the body appears most suitable to the ingredients.

The solution will not cling to a smooth surface; therefore, when possible, roughen it with a rasp after skiving. This accomplished, well shake the solution and cover the patch, and likewise the place prepared for it; let the solution dry, and repeat until it dries white all over. The patch is now ready for sticking, and to do this requires a slow fire. If the fire is at all fierce, hold the boot and the patch at a considerable distance, or they will not hold. When the solution is melted, carefully place the patch, taking great care not to let the edge go beyond where skived; rather keep it a little within; it must be kept free from puckers. Let it stand while you get ready your wax-end thread to sew the patch down to the sole, or if you do not intend to sew it down, allow time to get the solution well set. Warm a glazing-iron, and with that smooth your patch by working it towards the edge. This has the effect of working out from under the patch any air or superfluous solution. When this is done, rub your finger over the surface, and any solution that may have remained can be pressed out. Then ink it over to stain the mark



that may be seen round the edge. In the case of brown or other coloured leather this must be omitted.

When this operation is accomplished, you have a patch that is invisible, and, in addition, will never come off. This method has frequently proved successful; but simply following the instructions given on the labels of the bottles generally ends in failure, and craftsmen abandon the practice on that account.

"Blind-stabbing" is another method of repairing boot tops, so called from having to find the hole inside a boot, where it is impossible to see. Blind-stabbing is one of the most important processes in the repairing of boots, as all repairs to the tops can be done in some form by this means—as patches, rips, toe-caps, new springs.

It is very handy when a vamp has a small crack in it, which is often the case. It can be darned up in two ways: first, by using two wax-ends and a zigzag stitch from one side to the other, as at A (Fig. 38); or by making the stitches with one wax-end only, as at B. This is the neater way, but it needs more care and attention.

In either case it is well to put a piece of leather under the crack. It will want skiving at the edge; a piece like Fig. 35 would do nicely. It is easy to get under if the patch is rolled up and passed through the crack, and then levelled by putting an awl through and unrolling it seeing that it is placed exactly under the crack.

In darning the patch, set each stitch from B to C (Fig. 38), taking hold of no more leather than necessary on either side; when this is done the whole length of the crack, start stitching backward, making the stitches from A to B (Fig. 39), which is a full-size sketch of the crack and stitches. This second stitching is to draw down the first row of stitches, and so make them

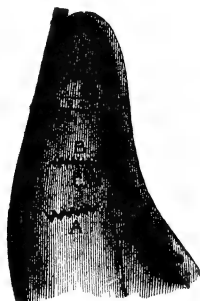


Fig. 38.—Crack mended with Cross and Zigzag Stitches.

look small. A fine wax-end or piece of twist should be used, and when this is lightly hammered down, and a piece of soft heel-ball rubbed in, it can be scarcely seen.

Fig. 40 illustrates the way to do blind-stabbing. The



Fig. 39.—Cross Stitch.

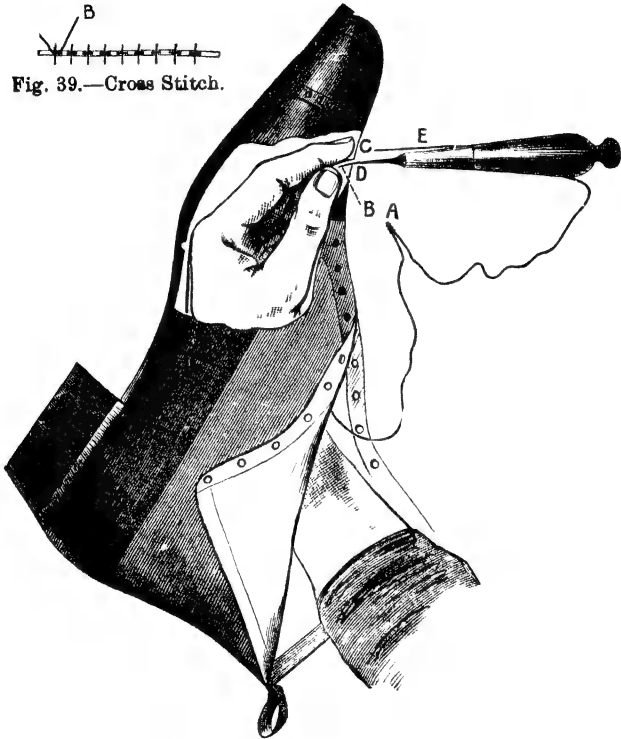


Fig. 40.—Blind Stabbing.

left hand is put inside the boot, one of the bristles being held between the thumb and finger, with the point of the bristle about level with the tip of the finger. The stab-awl, which has a thin straight blade, is held in the right hand, which at the same time holds the other

bristle, *E*. It is well to first put the two bristles together, and halve the thread and give it a twist, as at *A*, so that both ends may be the same length in working.

The awl is then put through the leather about

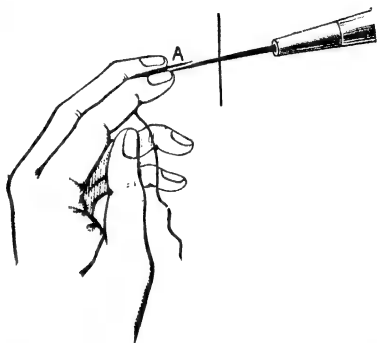


Fig. 41.—Blind Stabbing.

half-way the length of the blade, its exact position is felt with the finger of the left hand, and the bristle is then laid parallel with it, as at *B*; to steady the hand, place the finger against the lining of the boot at *C*;



Fig. 42.—Upholsterer's Needle.

withdraw the awl to within about  $\frac{1}{4}$  in. of its point, pushing up the bristle with it, and letting the bristle lie on the flat side of the awl; move the awl and bristle up and down, but do not entirely withdraw it until the point of the bristle finds its way into the hole with the awl. It is quite easy to move the awl up and down if the first finger of the right hand is kept on the leather at *C*. When the bristle is in the hole at *D*, pull it through with the right hand, and hold it in the hand with the awl, as shown at *E*. Again put the left hand inside the boot with the other bristle: make a second

hole, and repeat the operations till the bristle is passed through. Take the right bristle, *E*, in the left hand, and pull out the left with the right hand, and draw both out together the whole length of the thread, pulling somewhat sharply, and give a final pull to tighten the



Fig. 43.—Needle in Handle.

stitch. This is continued as far as necessary, putting from twelve to eighteen stitches to the inch.

The position of the boot in Fig. 44 shows how it should be held upon the knees; but while drawing out

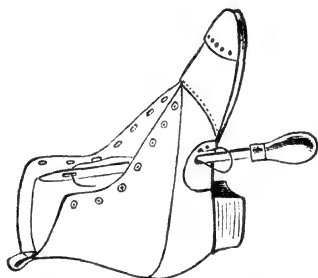


Fig. 44.—Makeshift Blind Stabbing.

the thread, it will have to be held fast between the legs, according to where the repair is being made.

When it is wanted to sew anywhere towards the toe or beyond the reach of the whole hand, shown in Fig. 40, the means of doing so is by holding the bristle between the first two fingers, as Fig. 41. The bristle is laid on the cushion of the second finger, and held there with the nail of the first, as shown at *A*. To blind-stab like this is more difficult, but being so useful, it pays for the extra trouble. Boys can soon learn to blind-stab, as their hands are small: and it is knowledge that will always be of use to them.

A makeshift method of blind-stabbing is to get an 8 in. upholsterer's needle (Fig. 42), which is very little stouter than an ordinary stout awl, put it in a handle (Fig. 43), fit the patch (Fig. 44), if stout leather, such as kip. Make holes with awl for light leather; use the needle carefully. Pass through with wax-end, draw out needle; see that ends of thread are level, thread the outside end, pass through second hole, draw out end inside boot, thread the inside end, pull out needle;

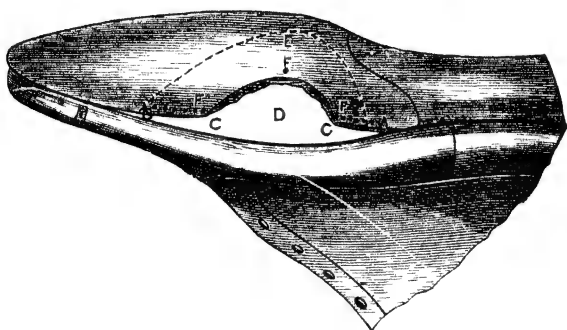


Fig. 45.—Sole raised to receive Underlay.

draw both ends tight, and continue till patch is sewn round. Work back a couple of stitches, cut off ends, and lightly tap with hammer to make the patch lie smooth. This method will suit a good many people who cannot use the wax-end with bristles. With this needle a patch can be sewn on in a quarter the time it could be done with wax-ends by a novice.

The minor repairs that have connection with the sole or bottom may now be dealt with.

Underlaying is putting a piece under a sole where it is worn. Many people wear away the sole very quickly on the outside, while a few do just the same on the inside; and in either case an underlay in time will often save a sole.

This repairing is accomplished sometimes by putting

the piece on outside. This is done because it is less trouble, but one should spare no pains to do a small job well, because it is that alone that will make a large one come easy.

To underlay, a last or iron foot must be put inside the boot to keep the part that wants repairing quite solid. If the boot is machine or hand-sewn, rip it with a knife from A to B (Fig. 45), and lift it up as c c. If it is riveted, it will have to be prised up with a blunt chisel, and the rivets drawn out from A to c and B to c. Cut out a wetted piece of good sole leather to the shape of Fig. 46, roughly skive it round the curved side, A A A, and then push it under the old leather at D (Fig. 45), but not

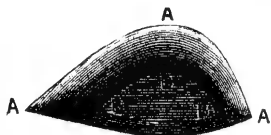


Fig. 46.—Leather Skived to form Underlay.

Fig. 47.—Skiver for Levelling.

quite as far as it will finally have to go; then trim the old leather round from c to c with a knife, not taking off much, but all that is weak and thin, and being careful not to cut the new leather. This done, knock the piece in to where it is wanted—that is, the dotted line E—and draw a pencil round the curve cut from c to c, to mark the new piece. Take out the piece (Fig. 46), and from the line B B and B scoop it out with the knife to A A and A, in the same way that is done in grafting a half sole, but in that case the old leather has to receive the new, and in this the new has to receive the old (c c, Fig. 45). Now put the piece in again, and put three short rivets in at F, F, F. Trim up the edge, leaving it quite full, to allow for graving, rasping, etc.

If the boot is hand-sewn, then the underlay must be sewn down from A to B, and it will look neater if a channel is cut in the new piece to receive the stitch.

but it may be sewn through in the same way that a patch on the upper is sewn down. If the boot is riveted or machine-sewn, the underlay can be riveted down from A to B, about the same distance from the edge, and in a like manner to that shown in Fig. 48; and in either case the edge can be knifed, pared, rasped, and finished as described on p. 26.

When a boot is worn very badly, the underlay is not always enough to make up the edge to the proper substance; then a little piece sufficiently thick to fill that vacant place can be skived off a piece of hard sole

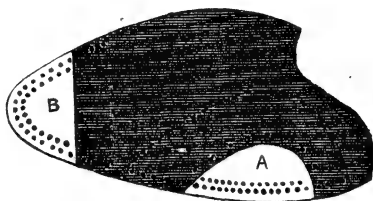


Fig. 48.—Toe-piece and Underlay.

leather, well wetted, somewhat the shape of Fig. 47, put under the layer, and riveted or sewn down with it.

Toe-piecing is similar to underlaying, except that it is at the toe end of the sole; but everything is fitted and done in the same way as shown by A and B (Fig. 48), which also shows how the underlays should be nailed both on the old and new leather. It is often wise to put both an underlay and a toe-piece as well to repair a sole, more especially when the boot is old, as it saves a whole sole, and uses up odd pieces of leather.

It sometimes happens that the upper leaves the sole for some distance along the side of the boot, as from A to B (Fig. 49). One way to sew them together again is by loop-stitching; the loop, which is inside and draws the upper to the sole, can be set at every stitch or each alternate one, but take care not to make large holes in the upper. To proceed, make a hole with the sewing-awl through the sole from A to C, draw the thread

through, and halve it; then with a fine stab-awl make a hole in the upper; at *a* put through the right hand end, and draw it through inside the boot; make another hole at *d* and draw the end through outside, as shown by *e*. The hole is found inside, as explained in the directions for blind-stabbing (p. 41). For such work as this, however, it can be done by the stitch-draw, explained later on. When thus far, make another hole through the sole from *p* to *r*; put the left end (*o*) in first, then

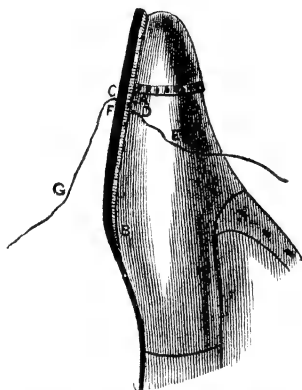


Fig. 49.—Loop Stitching.

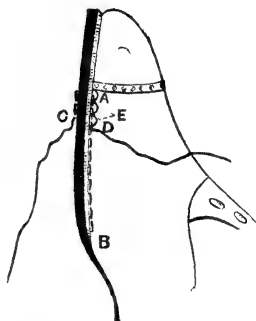


Fig. 50.—Seat Stitching.

the right (*e*), pull them tight on both sides, and the loop-stitch is set.

The seat-stitch is another way. For this a row of rather long stitches are set in the upper, from *a* to *b* (Fig. 50). This can be done with a stout stab-awl and a sewing-thread (size about 9 cord of "Patent No. 9"), with the stitches quite close to the sole. Then, at *a*, bore through the sole a hole, *a c* (Fig. 49), being careful to make it exactly opposite the centre of the first stitch on the upper, *a* (Fig. 50). Lift up this stitch by putting the point of the sewing-awl under. Put an end through this stitch and through the hole made in the sole, and halve thread as before. This leaves one end in the sole



on the left and one through the stitch on the right, as at c and d. There are three stitches set to show how each stitch is caught up and drawn down; the two loops at e are left loose to illustrate. Each stitch must be pulled in quite tight, as that is what draws the upper to the sole.

The stitch-draw is a ready means of finding the hole inside a boot, where it cannot be seen. For instance, take the fore part of a boot (Fig. 51), and to get a bristle through at A from the inside; B B B is a spare end of thread, which can be put from the outside through the hole A, and drawn nearly through; then, some little distance away from the bristle (say at c), a hole can be made through B with a fine awl; then take out one end of the sewing-thread, and put the bristle D through the hole c, till you get to the junction of the bristle where the thread goes between, as shown at c; then at E pull the thread, B B B, until the bristle D F is through to the outside; take it out of B B B, hold it at D with the left hand, while B B B is pulled through with the right from the inside. This, it will be seen, is blind-stabbing with less learning; and although this is very handy, it will prove to be blind-stabbing with less speed.

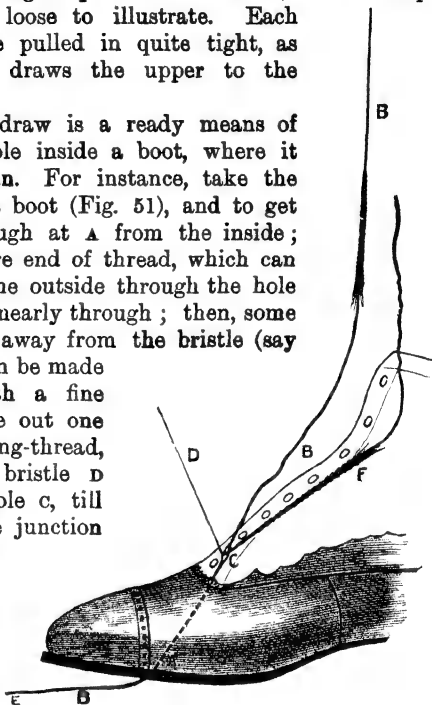


Fig. 51.—Stitch Drawing.

To sew on a loose toe-cap, first put a last into the boot, double the cap, to find the half or centre. The

half of the longest curve of the cap—that is, the part that will be sewn down to the sole, is placed exactly central on the toe, and a tack is driven through it into the sole. The two ends of the toe-cap are then held firm, one drawn down tight at either side, and a tack put in to keep each corner in its place, seeing first that the toe-cap is perfectly straight; otherwise, it will look very unsightly when finished. Previous to sewing down, drive the toe-cap, with rather a blunt chisel, between the upper and the welt. This will enable the sewing stitches to be put further back, and make a neater job.

## CHAPTER III.

### RE-WELTING AND RE-SOLING.

To re-welt and re-sole hand-sewn boots are certainly the two most difficult repairs, they are also the most important, being the nearest approach to the making of a boot. When, by practising with repairs, skill has been attained in using the awl and thread; although the present work is the harder, it ought to come easier than some of the minor repairs did at an earlier stage. In shoe repairing, a week seldom passes without a job of some kind to give a little varied practice and keep the hand in trim.

To proceed with the work in hand, a last must always be put in and fitted well to the boot or shoe, or you will not be able to make them look well, and there is a chance of making them smaller. Pieces of stout leather can be put on top of the lasts, or even pieces of bundle-of-firewood will do, tapered at one end, and the thin end knocked in first; but then, this must be done carefully, or the vamp may break just in front of the lacing. Fitting them up well in this form should make the bottom solid all over, and keep them in their proper shape.

A thin long tack must be put in the back of the boot to keep the last in its place, as at A (Fig. 52). Then put the sole and welt part in water, and when wet, take out the boot, wipe it, and cut the old sole off. This is done by putting a knife between the sole and welt at B, and continuing right along, round the toe, and down the other side to C. The old sole can then be cut away, cutting across from D to E to make a riveted or pegged graft, as shown on p. 51, or from F to G to make a sewn graft.

In either case a small hole can be made in the old leather at H, and a piece of wax-end put through, that it

may be drawn down flat on to the top of the heel, securing it there by tying the thread round the nail at *A*. This keeps the old sole in position while grafting, and while sewing in the welt. If you intend to welt the boot all round, carefully cut the old welt away from *i* to *j*, and temporarily remove the bottom filling, *k*. The next thing is to fit the welt, which is a long strip of oil-dressed leather, costing from 6d. per pair. The welt must be buffed on the grain side, cut in two straight

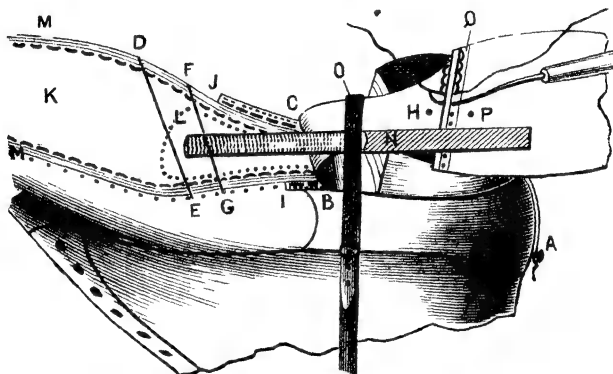


Fig. 52.—Grafting Sole to Waist.

down the centre, tied in a loose knot, and put into water to get thoroughly soaked ; for they have to be used wet. Before they are ready for use, an angular piece is taken off the grain side, as shown at *A* (Fig. 53). Grain side down, the welt will show an end like Fig. 53, and this is the position it is held while being sewn in.

The sewing is done as shown in Fig. 54, starting by putting the thread in at *A*, then halving the thread, and making a hole at *B*, and while the awl is in place the welt against the upper at its point, and make a hole in it at *L*. The hole is made as shown by the arrow in Fig. 53. First put the bristle in the left hand through, then the one in the right, and pull them both out, changing the bristles by this means into the other hands, and set the

stitch with a final pull. Continue this (as in Fig. 54) until the old welt on the other side is reached.

Use a sewing-awl and a thread of about the same substance to sew in the welt. When this is sewn in, hammer the seam down all round, giving firm blows, so as not to break or bruise it. Then carefully skive off any stuff above the seam that may make it uneven or clumsy, but do not cut near the seam stitches to weaken them.

For repairs, it is only necessary to skive the ends at

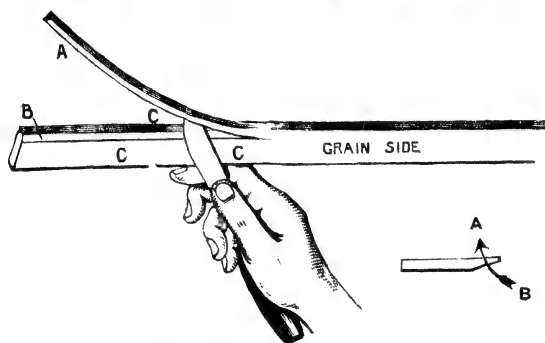


Fig. 53.—Cutting Welts.

the waist part of the welt a little thinner after they are sewn in. This can, and should, be done first; but a novice is apt to make the welt too thin, and weaken it where it should be solid, having to stand against the splice or graft in the sole. A piece of bone should now be rubbed round to make the welt flat to receive the stitches with which the sole will have to be stitched on. The edge of the welt must now be rounded to the shape required. Generally, the proper width for a pair of welts is that of the leather when split in two; but at places the stitching somewhat contracts it, and thus leaves prominent parts, which are best cut off; and, as shown by the dotted line in Fig. 54, the welt is always a little too wide at the waist.

If the old bottom filling is good, paste it in again at

κ (Fig. 52); if not, replace it with new. Felt is used for this purpose; cut a piece a little larger than the old, and paste down the shank—this is generally a piece of skived leather, which reaches from under the heel to the dotted line, L (Fig. 52), and just the width of the waist. Then paste the new piece of felt in the bottom, well hammer it in all over; and when dry skive off the edge all round at M M (Fig. 52), making it level with

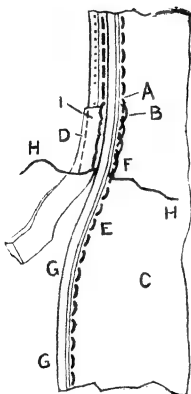


Fig. 54.—Welt prepared for Sewing.

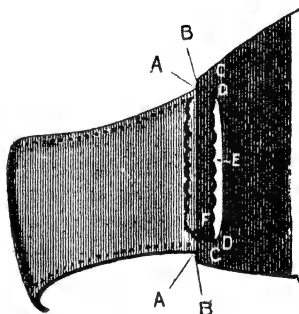


Fig. 55.—Sewn Graft.

the welt stitch and the centre, κ. It is then ready to receive the sole.

But if you intend to make a sewn graft, this graft must be made prior to placing the sole down. To do this, it is important to have the old leather cut straight across, and straight through from A to A (Fig. 55), and the same with the new sole from B to B. Then draw a line from C to C about  $\frac{3}{8}$  in. from the edge, and about  $\frac{1}{8}$  in. from this a second one from D to D.

From D to D on the first line cut in the leather a groove about  $\frac{1}{8}$  in. deep, but not going through, holding the knife quite upright; this cut can then be opened with any blunt instrument, to show the depth of it. Then from this channel cut away one side towards the toe to

the second line, *c c*, holding the knife quite slanting. This is to make a channel, as shown at *E*, to receive the stitches and so make a flat sunk seam to the graft.

Make a series of holes (about five to the inch) from *D* to *D* with a sewing-awl, placing the point on the bottom of the channel, and pushing it until the point comes through the edge of the leather, *B B*, about  $\frac{1}{8}$  in. from the grain side. All this should be done on the flesh side, with the leather fitted in the same way as shown on page 24, with the exception that, this being sewn work, the leather has to be used a little wetter.

The boot is now put across the knees, in the position shown in Fig. 52, with the toe towards the left and the back part towards the right knee, and—as also shown in the illustration—with the old waist tied back. The new sole can be put against the old leather, and an old rasp, *N*, put along the top, as shown, and the strap or rope, *O*, placed round the waist of the boot, as shown, and passing over the rasp. The strap will, as it is pressed by the worker's foot upon the shank, *L*, the old waist, *H*, and the new sole, *P*, keep them all solid while the graft is being sewn. A strong thread—about fifteen strands of No. 9 Patent, or its equivalent of stouter hemp—should be used, and plenty of wax should be worked into the thread before it is twisted.

The sewing should commence at the upper end in Fig. 55, and continue across to the lower, tying a small but firm knot, as shown at *F*, as each end of the seam must be particularly solid. For this reason it is well to make two short threads, using one for each graft: this is better than starting and ending with a knot. Novices wear out a thread quicker than experienced workmen do, as they handle it more, and pull it through with occasional jerks. Even at the expense of neatness, this seam must be made solid; this cannot so well be attained in riveted work.

This grafting is done with the piece on the top of the heel, according to the position of the old leather, as will be seen in Fig. 52. This is the most convenient plan,

and the old top-piece of the heel provides a flat surface to work upon.

If it is found difficult to keep the sole firmly in position by means of the rasp only, a long rivet can be put in through into the old lifts at H, and another at P (Fig. 52). The heeling should be left till the soling is done, and the two holes can be rubbed out in the finishing.

After the graft is sewn the whole of the bottom, K and L; the new sole, P, and the old shank, H, should

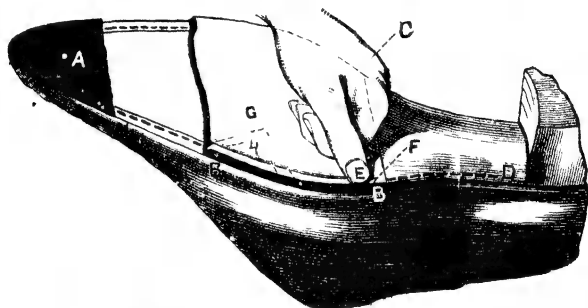


Fig. 56.—Fitting, Stitching, and Sewing.

have a thin coat of paste. The sole can now be put into its place, and pulled towards the toe to keep it in position. A rivet is put through at A (Fig. 56), and another through the hole, P, in Fig. 52.

This done, hammer the sole evenly all over, and then pare it all round the edge, close to the welt, as shown at B B (Fig. 56). As the sole is wet, with a little care this can be done easily without cutting the upper part, and should form one even edge all round, kept square or at right angles with the flat of the sole, taking care not to go too close to the welt. A line can now be drawn all round with the compasses, about  $\frac{1}{8}$  in. from the edge; and upon this line the channel is to be cut to receive the stitch.

The boot is held sole upwards between the knees, with



the toe towards you ; and to cut the channel, use a sharp-pointed knife, held near the point between the thumb and finger, letting the second finger rest upon the edge of the sole. The knife will be somewhat in the position of a pen while writing ; but it must be held firmly, and it should form an angle of about  $50^{\circ}$  with the flat of the welt. The channel should be cut through the grain and into the fibrous and wear-resisting part of the sole deep enough to let the thread lie well below the surface. This will be nearly half-way through the leather, whatever its thickness may be, as it is the substance of the sole that will govern the thickness of the thread, which will have to lie in the channel. The thread being thus embedded in the firm part of the sole gives solidity to the stitching, and leaves the grain free to form a covering for the stitch.

When the cut has been made (Fig. 56) from B round the toe to C, it can be opened with any blunt instrument. This is so that you may see the point of the awl when it comes out in the pit or centre of the channel, and also to give space for the stitch to fall into. To prevent the stitching-awl from notching the inner edge of the channel, which would make it irregular and unsightly when finished, it can be turned over for about two inches ; and when about a dozen stitches have been made, pass the left-hand thumb-nail along the channel from the last stitch, and turn over for another two inches.

Stitching on the sole is generally done when a boot has been welted ; and before this, the waist will have to be sewn down. It does not matter about a channel being cut in the old waist leather, as this can be blacked : which helps to hide the stitch ; though if the leather is sufficiently thick to admit of a channel, this will make a neater finish.

The sewing is started at D (Fig. 56), and the sewing-awl (Fig. 57) is used till the first stitch on the new leather is reached at E ; then the stitching-awl (Fig. 58) is used. At the two points, E and C, the sewing and

stitching should be so arranged that a stitch extends across the graft from the old to the new leather at B, and from the new to old at C, so as to make these weakest points quite solid.

The technical meaning of sewing is that two or more pieces are held together, and shoemakers call all work sewn that is treated with a round awl; while stitching is only technically applied where the square awl is used.

The stitching-awl is put into the same sort of handle,

Fig. 57.—Sewing-awl.

and is a similar tool to the sewing-awl, with the exception of being flat (as shown in Fig. 58); and it is now almost generally known as the square awl. From this figure it will be seen that when put into the handle the stitching-awl has a double curve. This makes it more



Fig. 58.—Blade of Stitching-awl.

handy to get into awkward places, and pressure on the handle gives a power that could not otherwise be obtained. The action of this awl is peculiar; it must not be wriggled about in the same manner as the sewing-awl; and in use it must be passed through by one rapid and almost straight push.

The boot is held by the strap on the knees, toe towards you, on its side, with the sole to the left, and the upper to the right. The thumb of the left hand is pressed firmly against the bottom of the sole, as shown by E in Fig. 56, just beyond where the point of the awl is to come out. The awl is then laid against the upper, with the point on the flat of the welt, and it is pushed through. One sharp push, at the same time dropping the elbow a little,

sends the point through the leather into the channel cut in the new sole, as shown at B B (Fig. 59).

A good idea of how a hand-made boot is put together can be gained by careful examination of Fig. 59. It shows a boot cut through at the centre of the sole. The various parts are lettered as follows: A, stitching-awl; B B, channel cut for stitches; C, sole; D, upper leather; E E, space for foot; F, in-sole; G G, welt stitch; H H, welt.

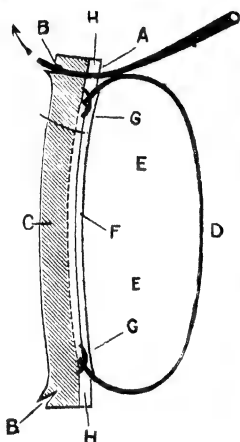


Fig. 59.—Section of Boot.

The stitching is continued round as far as the new leather goes; the old leather is then sewn, as was done on the opposite side. The channel is again opened, and the stitches within it are well rubbed down with the bone. A little paste is rubbed in all round with a piece of rag put over the right thumb-nail, which is put in the channel, and passed all round the channel in the sole.

The raised edge of the channel is rasped away with an old file, taking strokes outward from the centre of the sole, the boot being held in the left hand, with the heel towards you. The file strokes proceed, as shown by the arrow at A B (Fig. 60), towards the toe, and are continued all round.

The boot is then replaced in the same position as at first, and the ridge over the channel is rubbed hard up and down with a bone or long stick, held with one end in each hand, as shown from C to D in Fig. 60, until the whole is smoothed. By these means the thin narrow strip of grain, H (Fig. 56), is thrown towards the edge, where it forms a burr all round. The boot is then held with the toe towards you. With the back of the knife the edge of the sole is scraped upwards, to throw this burr

over the face of the sole. The knife is then held flat on to the sole, and the burr cut off level with the face. The stitches on the welt side are then rubbed down a little with the tapered bone, wetting a little with the mouth while using it. The sole is then well and evenly hammered all over.

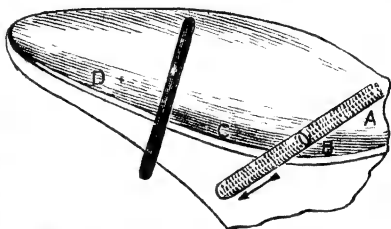


Fig. 60.—Rubbing down Channel.

As the stitch is wanted to show up boldly on the welt, the fudge-wheel (Fig. 61) should be run

round it before the stitching is commenced. This wheel makes an impression on the leather resembling stitching, and the real stitching will appear regular if the awl is put through exactly in the wheel-marks. To get

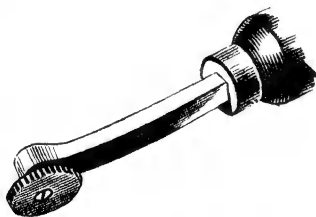


Fig. 61.—Fudge-wheel.

a bold and even stitch, the principal factor is a mode of setting the stitch. Each time that the awl is taken out, put in the left-hand bristle first, as usual, and in putting in the other bristle, on the right side, let it pass on top of

the first. This will throw the stitch up towards the edge; and if carefully done with each one, the stitches will show one straight line. The stitches can be set from 12 to 16, or even 18, to the inch, according to the style of work; 14 will do well for ordinary repairs.

After the stitches are rubbed down, the warmed fudge-wheel can be carefully run round the sole, each cog to go between each stitch. This will prick up the stitch; or a prick-stitch can be used between each stitch.

The boots are then finished in the way described in Chap. VIII.

To make a thread for either stitching or sewing, flax or hemp is used. This is sold in balls ready for casting and twisting, and should always be drawn from the inner end. It is convenient to place the ball in a box and draw the thread through a hole. The thread is first broken at about 6 in. from the end to the form shown at A (Fig. 62). This is done by rolling it on

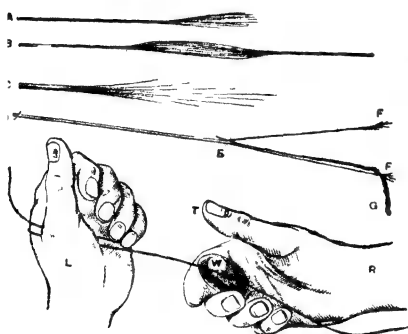


Fig. 62.—Waxing the Thread.

the right thigh with a long sweep of the right hand. This action untwists the fibres, as at B, and a smart jerk with the left hand parts the threads, leaving the flossy ends as shown at A; the short end is thrown away.

The length of thread commonly used is about three yards, and several pieces of about this length are broken from the ball. For stitching purposes the thread ranges from about 5 to 9 strands, and for sewing-up to about 15 strands. At C is shown the end of a thread having 8 strands, and it will be noticed that these ends are placed at different places, lengthways, so as to form a tapering end to the threads when all are twisted together.

Having broken off the requisite number of strands they are hooked midway of their length over a nail and twisted by rolling on the knee in the way described for breaking the strand. About a dozen sweeps of the hand should suffice for each end. The whole thread is then held at full length to allow the twisting to distribute itself evenly, and wiped smooth with a cloth.

Waxing the thread is the next process, and to do this follow the plan shown in Fig. 62, where L is the left hand and R the right. The thread is wound round the left hand leaving a length of about 2 ft. for waxing with the wax, marked w, and held in the right hand as shown. The thread is laid in the wax and held firmly upon it by the thumb, T, and waxed by drawing the hands apart; this is repeated a few times, as may be necessary. The thread is then unwound from the left hand, and another length of about 2 ft. is waxed.

Select a good pair of bristles to go on each end of the thread; cut off the bulby part from one end by a slanting cut as at D. At E, bend both bristles across the thumb-nail, and split them to this point by tearing asunder the bushy part of the hair at F. Place the tapered end of the waxed thread between the two split portions, and carefully plait the whole together. Finally, a hole is made with a fine awl at E, and the point of the bristle is threaded through it; this secures the join against unplaiting. A bristle may be twisted on by rolling the fine-tapered point of the thread round it.

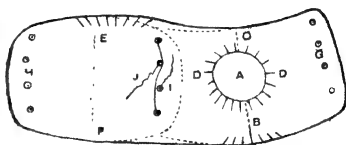


Fig. 63.—Hand-leather.

In order to draw the stitches tight in sewing, a hand-leather (Fig. 63) is indispensable. It is easily made from a piece of old leather, and its dimensions are from about 8 in. to 10 in. long, and  $2\frac{1}{2}$  in. to 3 in. wide. The shape is shown in the illustration; the leather is folded at the dotted lines, B C, and F E, and the ends are laced together at I J. In the position indicated at A a hole is made, about 1 in. diameter, for the thumb to pass through, the short strokes at B, D, and E show where the leather is snipped. The ends G and H are laced together as shown at I J, and the leather is placed on the left hand with the lapped ends in the palm and the thumb passing through the hole A.

## CHAPTER IV.

## BOOT MAKING.

IN making a pair of boots or shoes, the lasts are the first requirements; and these cannot be done without. To know the size wanted, it is necessary to take the measurement of each foot. To do this, place a sheet of paper on the floor or any smooth surface, then let the person stand full weight upon it, and draw on the paper an outline of the foot, being careful to hold the pencil quite upright, especially at the toe, D, and heel, C (Fig. 64). Then,

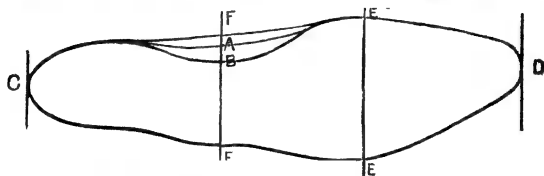


Fig. 64.—Shape of Foot Drawn on Paper

to show the curvature of the waist, draw a second and third line, as A and B. It is customary to take the length of the foot with a size-stick, but as the only use for this tool is to measure the last, it is not necessary to give an illustration of it. A size-stick is in the form of a rule, and has at one end an upright at right angles, and another to slide along so that it can be set to the top of the toe to indicate the length on the foot, as the stick is pressed against the sole of the foot and the fixed upright at the back of the heel.

Fig. 65 represents a shoemaker's tape measure; on one side it has inches, and on the other sizes which are three to an inch. With this tape take the length of the draft from C to D (Fig. 64), and, supposing it to measure size 5 (A 5's last measures just 10 in), you will

need a last size 7. The length taken with a size-stick, with the foot off the ground, would have shown size 4, but a 7's would have been needed just the same. This proves that the joints in the toes elongate in walking



Fig. 65.—Shoemaker's Tape Measure

and it shows the necessity of having the boot or shoe longer than the foot. When the length of the foot has been ascertained, it should be marked upon the drawing.

The next measurement to be taken is the joint ; and this should be done in inches. The tape must encircle

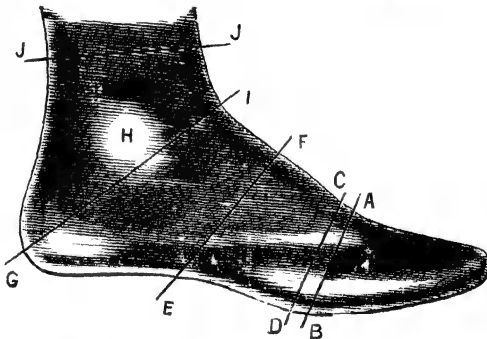


Fig. 66.—Measuring a Stockinged Foot.

the whole joint, and be drawn only just tight ; it must pass under the foot at *E E* (Fig. 64), and over the great toe joint and knuckle of the little toe, *A B* (Fig. 66). This measurement is then marked on the draft, and so with each until all are taken. Take the second joint, *C D* (Fig. 66), passing round the larger parts of the ball of the foot. Next the instep, *E F* (Fig. 66), letting the tape pass under the hollow of the inside waist, *E*, across the bone marked *F* in Fig. 64, and the instep bone, *F*. The heel measure is taken, passing round (*G*) the extremity of heel, under the ankle bone (*H*), and across the throat of



the foot (i). The leg measure is taken about  $1\frac{1}{2}$  in. above the ankle bone (H), and encircling the leg from J to J.

The measurements generally taken are those shown

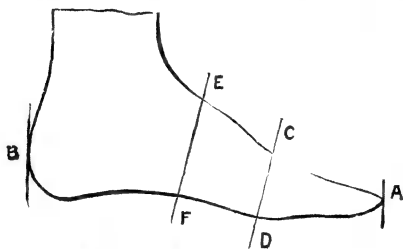


Fig. 67.—Measuring a Last.

in Fig. 67, where A B is the length, C D the girth round the toe-joints, and E F the girth round the instep.

In fitting up the last to the measures taken, if the boots are wanted to be a good and not an easy fit for a

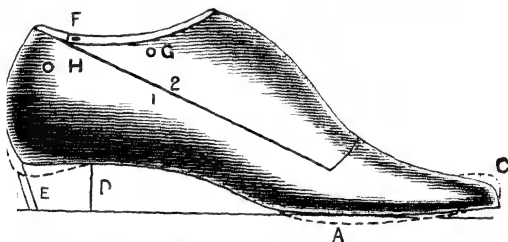


Fig. 68.—A Last.

gentleman's foot, one neither very bony nor very fat, let the last be exactly the same measure as that of the foot. For a lady's foot, the last will need to be about half a size—that is, one-sixth of an inch—smaller than the measure at the joints and instep, unless the boots are wanted very easy. If wanted easy for gentlemen's boots, make them about half a size over the measure. For all children's work about a quarter size over the measure must be taken.

English lasts can now be got at prices ranging from 2s. to 5s. per pair, according to whether they are ladies', gent's, or children's sizes. Old foreign lasts are often not of good shape, but those of four or five fitting have nearly always enough stuff to allow of their being trimmed down to make a good-shaped last. Select a last the toe of which is as nearly as possible the shape required, then place it on the sketch of the foot, and see if the lines of construction are similar in both, and if the girths are right.

The dotted lines in Fig. 68 indicate the parts of these lasts that are usually faulty; but with a little skill and

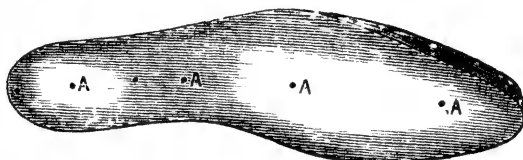


Fig. 69.—Bottom of Last.

trouble the superfluous material can soon be removed with a good rasp. In doing this, the bottom of the lasts should be shaped as in Fig. 69. This method will save the trouble and expense of having a pair made by the last maker, and a really good shape can be got to match the shape of your foot by yourself as well as by anyone else; you then take the credit of making the boot and also of fitting the last, and this will give you confidence to fit a pair to any other person's foot.

Fig. 68 shows the proper shape of a last—it is not rounded too much at the bottom (A), nor does it project too much at B or C. A round bottom will make the toe turn up, and, while the boot is being worn, will cause undue strain on certain parts of the front or vamp part. Too much stuff at B will tend to throw the heel of the boot too far back, and also make it higher at the waist (D) than at the back, as shown by the two lines B and D. If the last has the dotted part at the heel rasped off, the

heel can be built all round in proportion, as shown by *n* and *e*. The disadvantage of a last being too prominent at *c* is that it makes the toe of the upper exceedingly difficult to last in.

In Fig. 69 will be seen three shapes for toes ; but the shape of the toe should make no difference in the construction of the last. No matter what the shape of the last is to be, space must be given for the great toe, or a bunion will be the result. It will be seen by comparison



Fig. 70.—Long Leather



Fig. 71.—Instep Leather.



Fig. 72.—Joint Leather.



Fig. 73.—Heel-pin.

Figs. 70 to 73.—Leather cut to Shape.

with Fig. 64 that the bottom of the last (Fig. 69) is designed to suit the requirements of the foot as it is drawn on the sheet of paper (Fig. 64).

Should the last be a little too small in the fitting (girth), or should larger boots be wanted to allow for thicker stockings, or even boots for a foot larger than the last is made for, a set of ordinary fittings will be found very handy. These are best made from flank ends of the leather, which is the softest part of crop belly, and cheap, because it is not much use for any other purpose. The leather must be well wetted, stretched with a pair of pincers, and cut out roughly to the shapes of Figs. 70, 71, 72, and 73. By carefully tacking these fittings on to a small last a larger last can be made of as good a shape as the original. Fig. 70 is called a

long leather (abbreviated L. L.); Fig. 71, an instep leather (abbreviated In.); Fig. 72, joint leather (abbreviated J.); Fig. 73, heel-pin (abbreviated H.-p.). Before being fitted to the last they should be skived thin to the edge; then while wet tack them on the last in their proper position, as indicated by the figures 1, 2, 3, and 4 in Fig. 74.

Each piece must be put on the last separately and allowed to dry before it is taken off in order to block it to

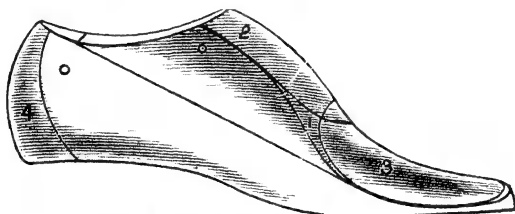


Fig. 74.—Last in Parts.

the last; then the edges can be cut evenly all round, taking care not to destroy the block or shape. Each piece must be served the same way. For facility in booking the fittings, they can be marked 1, 2, 3, and 4, as shown in Fig. 74. Supposing a last, numbered X for reference, is used with no fittings on, book it as 7's, No. — bare; if used with heel-pin, toe-pin, and one long leather, book it 7's, No. —, H.-p., In., and No. 1, L.L., and so on for any fittings. Bunion pieces should be pegged on with fine  $\frac{1}{8}$  in. pegs. The leather must be put on wet, and pegged so that it can be skived down all round smooth to the last, leaving an even projection to the shape desired. To put in these pegs, a hole must be made with a peg-awl (Fig. 75) as deep as the peg is long, the peg being driven home with one blow from the hammer.



Fig. 75.—Peg-awl.

An old shoe that is well worn to the shape of the foot will be found the safest guide to fit the last up to. If the toe you want to make is wider than that of

the old shoe, cut this round, to admit of the leather spreading out to the shape of the last about to be put in. If needed, rasp the last till it just fits in the shoe. Try the old shoe again on the foot, and chalk mark where it in any way hurts; replace the last, and with a fine awl prick these marks through into the last, then put pieces of wet leather on the last at these points, and make room for corns. The last should be as big as the measure—a sixth of an inch larger at the joint—if the shoes are wanted very easy. A last placed inside an old shoe soon shows if it is of the size and the shape to suit your tread. A piece for a corn or bunion can soon be added anywhere by pegging on a piece of leather. The exact spot for such a piece is readily found while the last is in the shoe; if the last is deficient at any part, the leather of the old shoe will be baggy. An awl pierced through it into the last will show exactly the place where room is wanted, and where you will need to make the last larger.

Iron lasts can be fitted up as explained for wood lasts. If the dealers have not got any to suit you, it is necessary to have holes drilled where you wish to nail the fittings. These holes must be plugged with wood to receive the nails. This is the best way; but if put on wet, and bound on till dry, some fittings can be fixed by Le Page's fish glue. Buy the iron lasts under the required measure, and fit them up afterwards to what is wanted. Iron lasts used for riveted work ought not to get rusty, as the leather for such work does not need to be worked damp. It should be properly wetted and hammered out, and then allowed to get so dry that it is only just mellow. Even in repairing it is not wise to sodden the leather too much before working upon it. If boots have been soaked by accident, or from having been worn in the wet and only just taken off the feet, they should not be worked upon until the leather is at least half-dry, or they will be knocked all out of shape. Any portion of the lasts likely to come into contact with wet leather could be covered with paper—either waterproof

packing-paper or that which buttermen use as a first cover for butter; or, failing these, ordinary thin brown paper.

Wood lasts must be used in making pegged work, as the peg-awl must go through all the materials, and a little way into the last. This is so that the peg shall go through, and be rubbed down inside by the use of the peg-rasp and peg-knife. Iron lasts would blunt the awl each time it made a hole, and as the peg could not go through all the layers of leather, solidity would not result.

Iron lasts are used for riveted boots, as the rivets are clenched as they reach the last. They are fitted up according to their particular constructions, and a joint or long-leather can be easily fixed with a wax-end to the last before putting it on the last. Of course, the leather must be fitted and blocked to shape on the last first. Or another, and the better, way is to have holes drilled in the last where fittings are wanted to be fitted on. These holes can be plugged with gutta-percha or wood, and the fittings nailed to the plugs. Plaster casts are sometimes taken, so that the customer leaves a model of his foot for the shoemaker to adapt a last of wood to the requirements of that foot. To make plaster casts of a foot, it must be oiled, and a mould taken first.

In choosing the materials, it should be remembered that a boot, like a house, depends upon the foundation, for which reason the leather should be good of its class, and every care exercised to fit it properly. Fig. 76 is a top or upper for a gent's lace (or Balmoral) boot, and the technical name for each piece is given. For light work the uppers are cut from glacé kid, light French calf, and patent leathers. Toe-caps are fitted as required. For stout work "box calf" is mostly used. For rough wear "zugg grain" and kip are used. There are many kinds of uppers other than that shown in Fig. 76, such as button, elastic, Bluchers, Derby, Balmorals, etc. Shoe uppers, as shown in Fig. 77, are termed

Oxford shoes. There are button shoes, elastic shoes, tie shoes, etc.

The leather for the bottoms of a pair of boots or shoes is called a set of stuff, and consists of insoles, outward soles, welts, stiffeners, shank pieces, side linings, felt, and according to height of heel, lifting and top-pieces. A heel about an inch high is made up of the sole, the split-lift, three whole lifts, and a top-piece; and for each addi-

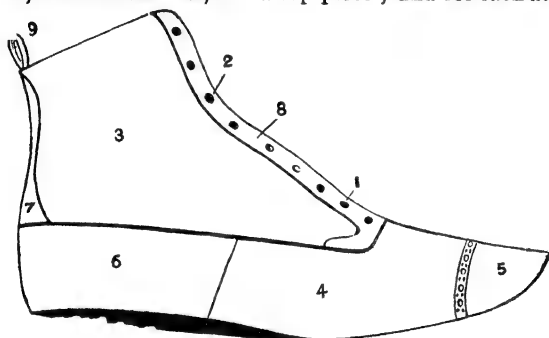


Fig. 76.—Gent's Lace Boot.

1. Eyelet; 2. Hooks; 3. Quarters; 4. Vamps; 5. Toe-cap;  
6. Golosh; 7. Back Strap; 8. Facing; 9. Loop.

tional  $\frac{1}{8}$  in. required, add one whole lift. The cost of a gent's medium-sized "set" should be about as follows:—Insoles, cut from shoulder, 10d.; a pair of long outer soles, 3s. 6d. These should be cut from English butt leather, a pale nut-brown, neither very yellow nor very red, these coloured leathers being foreign. The English leather should have a very fine grain, it being a thin layer only, and the fibrous tissues of the true skin should be very firm, close, fine, and of a nut-brown colour. Gent's soles are cut in one piece, called squares; whereas ladies' soles, which are also cut in one piece, are called springs. Welts consist of a long strip of leather (generally oil-dressed) about  $\frac{3}{4}$  in. wide, and cost from 6d. per pair. Stiffeners, cut from shoulder or

middle, cost 7d.; lifting pieces, from first cut of butt leather, about 1s. 2d. for three pairs; top pieces for the heels must be of good solid butt leather, like that for the soles; a pair cost 1s. Gent's soles are not cut long-enough to go through to the heel, so a piece of sole leather is required to splice on to them; it need not be of very good quality, and with the side-linings will cost about 1s. These prices must serve only as a guide, for much will depend upon the class of boots or shoes to be made.

Having procured a set of stuff, the way to wet, flesh,

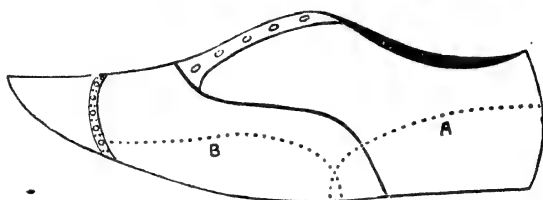


Fig. 77.—Oxford Shoe.

A. Stiffener; B. Side Lining.

dry, buff, and hammer it, preparatory to using it, is as follows:—Put the insoles, outer soles, stiffeners, lifts, and top-pieces in a pan of clean water, letting the water cover them. With a pair of compasses mark straight down the centre of the welts, and cut them so that both sides are the same width; tie them up in a knot, and put them in the water. When all the pieces are perfectly wet through, they should be laid in a draught—not near a fire—to dry, with the exception of the welts, which have to be used wet.

The insoles require to dry whilst fixed on the last. They must be marked with the sewing-awl to the shape of the last, then cut out, and while still wet the grain side is buffed or scraped, and the insole tacked grain side down on the bottom of the last with four tacks in the middle, as A, A, A, and A, shown in Fig. 69, p. 65. The



sides should then be stretched all round with a pair of pincers, and the leather tacked down to keep it tight to the bottom of the last till nearly dry ; this is called blocking the insoles.

The outer soles should dry till they are only just mellow ; then lightly buff off the grain, and skive off the thin layer of flesh or dressing from the back, and do the same with the lifts and top-pieces. Sit upon a low stool, and place the lap-iron face upwards on the thighs, just above the knees ; hold the leather grain side downwards, and, commencing from the centre, hammer it all over. Let each stroke be even, straight, and firm :

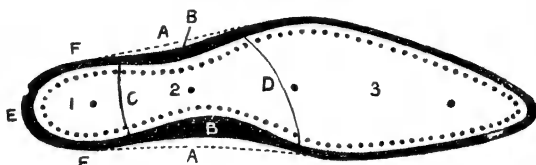


Fig. 78.—Inner Sole, Filled and Holed.

strike with the face of the hammer, and do not bruise the leather. Leather is hammered to make the fibrous tissues more dense, and thus less pervious to damp, and offering more resistance to wear. The lifts do not want to be hammered so hard as the soles and top-pieces.

When the insoles are nearly dry, carefully take out the tacks from the edge, and with a knife round up each to the shape of the last. At the waist the insole must be trimmed narrower than the last, as shown at B B (Fig. 78), where the dotted lines, A A, represent the last.

To make the awl work better in making the holes, rub a little soap all over the leather. With a pair of compasses draw a marginal line the whole way round the sole from  $\frac{1}{4}$  in. to  $\frac{1}{2}$  in. from the edge, and by drawing the two cross lines C and D, divide the sole into three: the heel (1), the waist (2), and the fore part (3). The margin should be a little wider at the middle of

waist, *B B*, particularly on the inside, the ends flowing into the regular line. The smartness of the waist depends upon this sweeping curve. According to the range and pitch of the last, see p. 103, the width of margin should be increased at the heel (Fig. 78). The more dead the last is in the waist, the more the heel will want under-seating: that is, to prevent the heel, when it has been



Fig. 79.—Prick-stitch.

built, from pitching on the breast, it will want to be feathered wide and sewn under at *E*, and feathered narrow and sewn full at *F* and *F*. This marginal line, when got to its proper shape, must be cut into the leather to about one-third of its thickness, the knife being held perpendicularly to the sole. This cut must be opened with a prick-stitch tool (Fig. 79). The whole

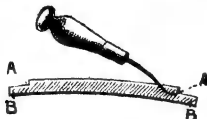


Fig. 80.—Awl Holing the Inner Sole.

of the narrow strip of leather is cut away, and this leaves the feather as shown in Fig. 80. It is of even substance all round the fore part, and of about two-thirds the original thickness of the insole leather. At the waist this can be thinner, and tapered towards the edge.

To hole this insole, make a new line on the face of the leather gauged from the feather about the same distance, and in the same way as that drawn from the edge for the cut in the feather. Put the sewing-awl through at this line, and bring the point out on the edge of the feather, as at *A A* in Fig. 80, which shows a transverse section of the insole and the feather, *B B*. After it is fitted carefully, take the insole off the last, and with a sharp knife take off the sharp edge of the

arris all round on the grain side, but not cutting away so much as to destroy the feather. Sometimes it is sufficient to scrape this sharp edge, and it can be removed by running the knife round while the insole is on the last ; but this needs more skill. If this sharp angle



Fig. 81.—Stiffener.

is not removed, it will probably curl up in wear, and hurt the foot.

The stiffeners should be of good leather, and used wet, that they may dry hard. Fig. 81 shows their shape. Gent's should be  $1\frac{3}{4}$  in. high at the back ; ladies',  $1\frac{1}{2}$  in. The dotted lines at A (Fig. 84) show about where they



Fig. 82.—Skiving Knife.

should come to, and the length can be decided by measuring the tops. They must be skived all round on both sides, but not much on the grain side, or the stiffness of the leather will be lost. Round the top the leather should be skived or tapered to a feather edge,



Fig. 83.—Side Lining.

but the bottom reduced only to half its original substance. A knife for skiving is shown in Fig. 82.

The side linings (Fig. 83) can be of almost any kind of upper leather, though, as it is oil-dressed, calf is best. The dotted line F, in Fig. 84, indicates its position in the boot or shoe.

## CHAPTER V.

## LASTING THE UPPER.

WHEN the inner soles are fitted, blocked, holed, etc., on the lasts, they are ready to receive the tops. Select the best of these for each particular foot. Much of the beauty of a boot or shoe depends upon the maker thoroughly mastering the principles of lasting.

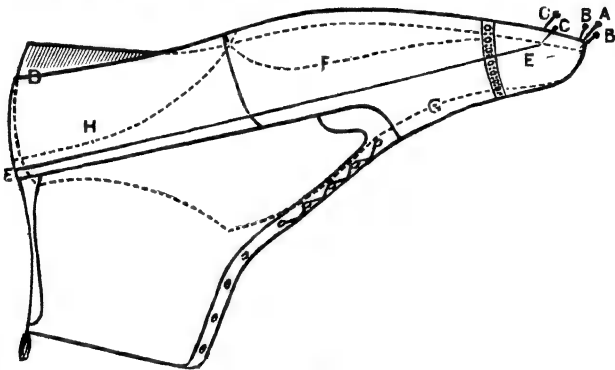


Fig. 84.—Ready for Lasting.

The upper should be laced up as far as the bend or throat, where the eyelets finish and the hooks start, to prevent it gaping open while being lasted and sewn. The stiffener H (Fig. 84) can be pasted on both sides, and put into the upper between the lining and the leather, the centre against the back seam of the golosh.

Place the last upon your knees, with the heel to the left and the toe to the right, inner sole downwards. Place the upper over the last, and with the right hand pull it down at the toe; get the back seam exactly in the centre of the last at the back, where the

upper covers only about two-thirds of the last, as shown at D (Fig. 84). This is called "horsing," or hoisting the back of the heel, and enables the boot to be lasted more forward. This will throw a draft into it which would be very hard to get by the use of the pincers only. Turn the last bottom upwards, hold the toe firmly with the right hand, place the heel between the knees,

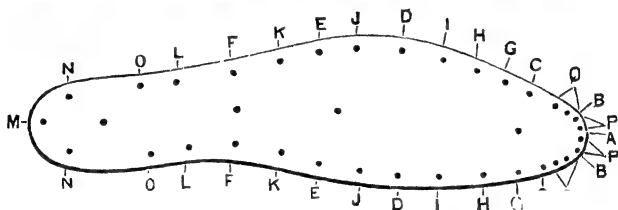


Fig. 85.—Sole of Last Showing Tacks.

change the left hand for the right at the toe, and, with the pincers in the right hand, very tightly draw the toe of the upper over the toe of the last, taking care that the back seam and centre of the vamp and toe are quite



Fig. 86.—Lasting Tack.

straight on the last. With the left hand hold the upper firmly where you have pulled it, place the forefinger on the spot where the pincers are, and hold the leather there till you can put in the first tack at A (Fig. 85). Fig. 86 shows a lasting tack— $\frac{3}{4}$  in. shoemaker's rivets will answer the purpose for light or medium work, but Scotch tacks are best. This plan of the sole of the last (Fig. 85) has each tack marked in alphabetical order, to show which is the proper order to put them in. The leather is then pulled over, and tacks put in at B and B, working in reasonable and equal portions of stuff between each two neighbouring tacks. All tacks used in lasting are put right through all materials, and are driven into

the last far enough to keep the work solid ; for although they are there only temporarily, they have to remain till the stitch takes their place in the sewn boot.

If the upper is quite straight upon the last, the two tacks next to be put in are *c* and *c* (Figs. 84 and 85). These are draft tacks, so called because they put and keep a draft in the boot or shoe. This draft is got by pulling hard with the pincers in the direction shown by the line *EE* (Fig. 84). To get this draft the upper is hoisted at the back as already mentioned ; when the whole of the fore part is lasted, the back or heel of the last is knocked down into its place, and it must necessarily form a line of tension at *EE*, and it is this tension which is called draft.

The main principles to be observed are tightness in lasting, drafting out of all the wrinkles and pipes around the toe, equal strain at all parts, and uniformity on both sides. It is this evenness in lasting which gives the finished boot a good appearance and makes it set nicely. A boot that is lasted properly when the last is out will look as shapely as it was before the last had been withdrawn.

The side linings (Fig. 83) are now put in between the lining and outside leather, they are not pasted, and their position is indicated by the dotted line *r*, Fig. 84. The two tacks *D* and *D* can now be put in to hold the side lining firm ; while lasting up the sides or round the heel, always see that the lining is lasted tightly ; otherwise, when the boot is finished, the lining will set in puckers and hurt the foot.

It will be seen in Fig. 84 that the top leather does not touch the last at *a* ; but it must be lasted, first on one side and then on the other, until all this fulness is got away, or the work will be too large when finished.

When all the tacks are driven in the fore half as far as *EE* (Fig. 85), the heel of the last can be knocked into the upper until the bottom of the golosh is just above the insole, for at the heel seats it does not need much to last over. The waist and seat can now be lasted

similarly to the fore part, but here the leather need not be pulled so hard, especially at the waist. In the case of a shoe it will only be necessary to pull over the leather with the thumb and finger, or all the draft may be pulled from the quarters (see Fig. 76), which would make them baggy at the sides in wear. The boot is now lasted, with the exception of the toe.

In lasting stout, heavy leather it is likely to either

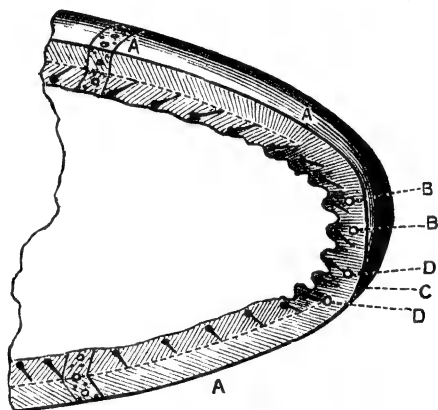


Fig. 87.—Lasting the Toe.

set away from the last or form itself into wrinkles at the heel, and even up the sides. All these wrinkles or pipes must be got clear away before commencing to sew in the seat or the welt. The toe is a portion that will always form itself into wrinkles, and special instructions for dealing with this are given. The other parts will not need so much humouring, though their treatment is exactly the same.

“Pipes” and “wrinkles” are technical terms used in lasting; they mean the hills and valleys that leather will form itself into where there is surplus stuff, and this fulness must be lasted away as explained. If when the toe is lasted as far as shown in Fig. 87 a Y-shaped piece of leather is cut out of each pipe,

you would be able to hammer it down and get out the wrinkles and pipes. This is sometimes done by slovenly workers, but no good craftsman would resort to such inferior means, for, although it looks very well at first when finished and in wear, the result is far from satisfactory.

We will now proceed with lasting the toe, which process can very well be left till the end, after the

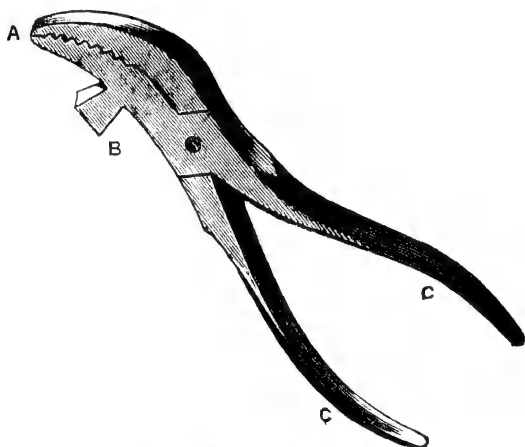


Fig. 88.—Shoemaker's Pincers.

first three tacks, A B B, have been put in (Fig. 85), as described on page 76. The toe is the most important part to last, and if not well and properly done gives a very ungainly appearance to the boot or shoe, both before and after wear. There must necessarily be a lot of wrinkles around the toe, and when a tack is put in, a pipe forms between it and the tack next to it. To last a toe properly, full stuff must be got round the toe end as much as possible, and here it must be lasted away: which means that, in putting in the draft tacks, stuff is drawn as much as possible to the toe. All fulness must be lasted away between these tacks, B B, dividing the



stuff equally between either side. These parts will need care to last them well ; negligence here causes great defects, because an unsightly appearance of unevenness is caused if these wrinkles are not lasted out. If the toe is lasted well at the outset, it will keep up and look smooth till the boot is worn out.

Next hammer the upper all round,  $\Delta \Delta$  and  $\Delta$  (Fig 87). This will knock out all the wrinkles in this region that the "pipes" have caused, and will have to be done each time a tack is put in or altered on the top. Before putting in each tack, the leather must be pulled quite tight. This is done according to the substance of

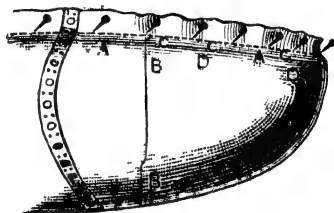


Fig. 89.—Side of Lasted Toe.

the tops ; the stouter they are the harder will be the work of lasting them.

Fig. 88 shows a pair of shoemaker's pincers,  $\Delta$  being the jaws in which to hold the leather. Lever the leather over, resting the fulcrum  $B$  on the inner sole, meanwhile pulling and pressing upon the handles  $c$  and  $c$ , holding them quite firmly, to give a proper grip of the leather. When this has been pulled enough, hold it in its place with the forefinger of the left hand until it has been made secure with a tack or rivet.

Keep putting tacks in round the toe as far as the toe-cap extends until all the pipes and wrinkles are out, and the toe quite smooth as far as the dotted line  $\Delta \Delta$ . (See Fig. 89.) It is often harder to smooth a wrinkle than it is to get rid of a pipe, because if a tack is put through the centre of the pipe, at  $B B$  (Fig. 87), between two other

tacks or the wrinkles they have made, this tack will help to last the pipe out, and it can be got clear away with a tap or two of the hammer. These means are useless for a deep wrinkle, in which case the tack that has formed it must be taken out and an awl put under tacks to lift up the wrinkle *c* and form a pipe. Two must be put in at *d* and *d*, and then the pipe can be easily tapped out.

When there is a toe-cap to the shoe, the vamp should be lasted first. While this is being done the toe-cap can be turned back as far as the line *B B* (Fig. 89). The vamp should be lasted as well as though it were not going to be covered with the cap. Before the cap is turned back into its place, to make an even surface to last the cap upon, the vamp may be lightly filed or rasped round in front of the tacks at *c*, *c*, *c* on the top, and at *d*, *d* round the edge, and then hammered again at both places.

In hammering the upper, do not give heavy blows, but only tap it. This can be done well all round the boot, especially at the toe, where there is double substance, at the sides, where the side linings are, and at the heel, where there are the stiffeners. This hammering will all help to keep the boot in shape when made.

When a top is very hard to last, and is difficult to get it close down to the last in front—which happens if the last is very hollow here, or the tops are heavy—the lasting may be done with the help of half of a pair of medium welts. A half is quite sufficient for one boot, and then the remaining half will do for the other boot. Make a hole in one end, get two large lasting tacks called sole tacks, cut two small circles of stout sole leather, and drive the tacks about half-way through, as at Fig. 86. Nail that end of the welt with the hole in it to one side of the boot with one of the tacks, knocking it into the round piece of leather. Hold the boot firmly with the left hand, and letting the piece of welt come right across the vamp, with the pincers pull the free end of welt on the other side, and get any

fulness away. Put a tack in the vamp, or put the other sole tack in through both the piece of welt and the vamp, until you have put a tack in each end of the piece of welt, then take out the sole tack and liberate the welt while again trying to get more purchase to pull, and the upper tighter to the last.

This system is also very good for the waist when that is hard to get in. However, the mode of treatment is different, although on the same principle, for if in lasting the fore part it cannot be got tight enough with the pincers, a sideways knock can be given to the two sole tacks which will send their heads nearer together over the inner sole, and so tighten the welt. In the waist the welt does not go over the upper, but simply across the inner sole, from *F* to *F* (Fig. 85). Although tops need not be lasted much in the waist, it often happens that they are cut so small that some means like the above must be resorted to in this case to tighten the upper. Put a chisel or file under the welt, and gently lever it up while you knock the tacks sideways, and at the same time drive them a little further in. As this tack has the piece of leather on it, this will prevent it from breaking away from the upper.

The welts should have been bought of the proper substance, and being already divided into two long strips and quite wet, all that is necessary is to take off a fine shaving from the grain side. If wanted lighter, reduce them from the flesh side by means of a welt mill, going down a rack a tooth at a time on each side till of the required substance, or an ordinary knife may be used, see p. 52. The welt next needs to have an angular piece taken off the whole length from a corner on the grain side. This piece is about two-thirds of the way through, and about  $\frac{3}{8}$  in. wide (as *A* in Fig. 85).

This process will give the welt an end section like Fig. 53; this is shown grain side down, which is the position in which it is sewn in the boot. The arrow, *A*, *B*, indicates where the sewing-awl has to pass through. If welt, this piece is to be skived for about 2 in. at *B* (Fig. 53).

The way to take off the angular strip is by digging the point of the knife into the cutting-board, at an angle so that the welt can pass between the knife, the board, and the first and second joint of the forefinger of the right hand. The position of the knife, hand, and welt can be seen in the illustration (Fig. 53). Then, when the welt is pulled at B with the left hand, this angular piece will be cut clean off.

The width proper for a welt is generally in accordance with the substance of the boot or shoe, but some quite light work is made with what might well be called an extra-full-wide welt. Gents' widths that are generally recognised are half-wide welt,  $\frac{1}{4}$  in. full from upper; three-quarter-wide welt,  $\frac{5}{8}$  in.; wide welt,  $\frac{3}{4}$  in.; full-wide welt,  $\frac{7}{8}$  in.; extra-full-wide welt,  $\frac{1}{2}$  in. In all cases the welt can be worked a little close on the inside, and full on the outside. A lady's can be  $\frac{1}{8}$  in. less than a gent.'s. For bevel work the welt should be thin before sewing in, and it is the sole that needs to be bevelled to fit the iron. To fit all leathers before using them for their varied purposes is most essential in all parts of boot making.

To make a welt for dress shoes with a  $\frac{1}{4}$  in. edge the leather must be light, more particularly the sole and welt; the latter should not only be very light, but the fibres of the leather should be extremely fine in texture on both sides. The grain must be buffed off the welts, and then these are split down the centre and wetted. If they are too thick, reduce them on the flesh side in a welt mill or skiving machine, and then fit in the ordinary way.

## CHAPTER VI.

## SEWING AND STITCHING.

Now the welts are fitted, the threads made, the boot lasted, and it is time to commence to sew. Before sewing, if the boot has dried, damp it all round over the holes, and well rub an old wet tooth-brush round the heel part, to moisten the edge of the stiffener.

Sewing in the welt is one of the most important

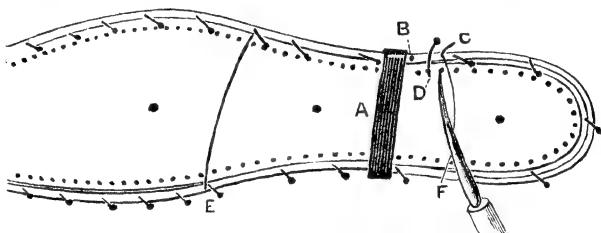


Fig. 90.—Sewing the Welt.

stages in boot and shoe making, as the ripping of a welt-seam nearly spoils the boot, since it cannot be well repaired without re-welting—a process far from pleasant if it has to be done before the sole is worn out. Before starting to sew, see that the thread is nicely twisted, waxed, and smooth throughout.

Commence sewing in the welt at the left corner of the seat, proceeding towards the waist, the boot to be held between your knees, toe towards you. In the right boot this side, the inside of the waist, will be the longest. With the welt, measure from this point to the corner of the joint of the sole. Mark this point in order to know the length the welt is to be in the waist, and for this distance skive the welt from the grain side to about half the substance. Then the welt is ready for sewing in.

If a strap is used, it should have the buckle under the left foot ; or if a stout piece of cord or rope is used, put the knot under the foot so that it is out of the way, and the thread does not catch in it and break while sewing. Place the boot, toe towards you, between the legs (which should be held close together), letting the strap go over the waist of the boot, as at *A* (Fig. 90), to keep it fixed while it is sewn. The tack at *B* can now be drawn, and the sewing-awl put in the first hole of the waist, as at *C*.

Fig. 91 shows a larger section of the welt being sewn. It is used grain side downwards, with the surface from which the angular piece was taken off against the upper. While the awl is passed through a hole in the insole in



Fig. 91.—Welt enlarged.

the position shown at *C* (Fig. 90), the welt shown (Fig. 91) is placed so that the awl may be passed through it at *A*, and is then withdrawn. The thread held in the left hand has one of its bristles put through the holes *A* (Fig. 91) and *C* (Fig. 90), which are now opposite. The thread is pulled through until the twisted centre is reached, and there is an equal length on each side, taking one end in each hand ; and, with the awl in the right and the hand-leather, described on p. 61, in the left, you are ready to set the first welt stitch. As before, the awl is put through the next hole *D* (Fig. 90), about 2 in. of the left bristle is passed through ; the right bristle follows similarly, but from the opposite side. The points of the bristle change hands, and each is pulled through simultaneously for nearly half a yard. This is done (with their points directed away from the work) holding the bristles between the thumb and finger, with the palms of the hands upwards. When the thread

is pulled out a little, the hands are twisted so as to give the thread a turn round the hand, where it is held by the thumb and finger of both hands, and so the first pull is finished. The thread is then dropped, and picked up again near the holes, the bristles being kept between the thumb and finger, ready to use again. Another stroke is made, and this will probably pull the whole of the thread through. But if not, another pull must be taken. These pulls must be made in quick succession until the stitch is set at the final stroke, which is a tightening pull. It must be hard, especially on the side which pulls the stitch into the welt; but an over-strong pull on the other side may possibly pull the



Fig. 92.—Awl and Bristle.

stitch through the in-sole. To give this extra strong tightening pull, wind the left thread end round the hand-leather on the left hand, and the right thread end round the end, or knob, of the handle of the awl, as *A* (Fig. 92). When this stitch is done and pulled in tight, the next and all following stitches can be proceeded with in a similar way.

After five or six stitches have been set, the seam can be knocked down with a hammer to make it smooth; but it must not be hit so hard as to bruise it. During this stoppage in the work it is well to wax at least one of the threads. It is best to wax only the end on the right side; then set another stitch and wax the other end, which this time is on the right. This is because the first time the thread passes through the leather a little wax is very apt to chip off and fly on to the work. In this way if the wax falls on the inner sole, it does no harm; otherwise, the wax would fall on the upper of the boot, and would need getting off, and would spoil

Russian or any coloured leather. The waxing is done by holding with the left hand one thread end straight above the work, holding a ball of wax in the thumb and finger of the right, and rubbing it up and down quickly and evenly.

Proceed in the same way with the rest of the welt-sewing, until the other joint (E, Fig. 90) at the commencement of the waist is reached. Here skive off the remainder of the grain which has been left on the welt, turning it back upon the sole or upon a piece of thin wood, and skiving it as was done the other end. Then

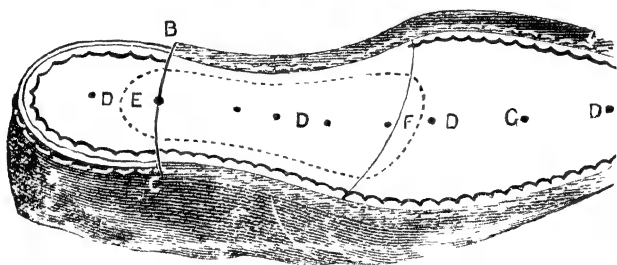


Fig. 93.—Welt Sewn in.

sew it in till the point F is reached; there it is cut off, and the last welt stitch set over the end. When the toe is reached, the boot will need turning end for end, toe from you. It is best to draw each tack, so that the work shall not come unlaced. When the seat is sewn in before the welt, this can be sewn in with the same thread.

The boot has now stitches in place of tacks, and all round there is surplus upper stuff, which must be cut off quite close to the stitch, but not so that it weakens the seam. The knife must be sharp, and the point dipped towards the inner sole, except at the heel seat, where it is held flat with the inner sole. The whole seam can be hammered down, to make it as smooth as possible.

In sewing in the heel seat, well wax the two ends, and there must not be a join in the thread; this must be



long enough to go the whole way round, otherwise a new thread must be used. Commence sewing in the same way as before, but use no welt; therefore, on one side the stitch will lay on the inner sole, and on the other on the upper, as at A (Fig. 93). This sewing commences at B and ends at C. Make very solid stitches, pull the last end through to the inner sole, and tie the two ends into a good knot, to make a solid finish. The four tacks D, D, D, D must be taken out. A piece of chalk is rubbed round on the stitches, and a piece of felt is laid on the inner sole and tapped all round. This leaves a chalk mark to show the size that the felt will need to be. The inner sole is pasted all over, the piece of felt is laid upon it, hammered all over, and left to dry, and it is then trimmed all round level with the welt. A piece of good solid leather, of the size marked out by the dotted line E and F, is pegged in the waist with about four pegs. It should be skived thin at the ends and sides, leaving it thick in the centre only. This leather is pasted, and a thin piece of felt, by warming and splitting the felt, placed over it. If the bottom is hollow at G, the felt must be pasted, and another layer laid in the same way as the first; the sole is required to be made just level with the welt. The whole surface, from heel to toe, should be quite smooth, and when a sprinkling of powdered French chalk has been rubbed in the boot is ready to receive the sole.

The sole leather has to be wetted, and dried until it is just mellow. Scrape off the grain, flesh the back, and then gently hammer it from the centre outwards. The dotted line in Fig. 94 shows the shape of the soles when bought in pairs, and also how the sole can be fitted to the boot so that, if it be a narrow toe, the piece G is not wasted. Two of these odd pieces will half heel a pair of boots, or, spliced together, will make one top-piece. Therefore, it is well to mark the sole round to the boot, and cut this piece off before putting the sole on. In this condition the sole leather is well pasted on the flesh side. The bottom of the boot must also have a coat of

paste, and French chalk should be sprinkled upon the felt to prevent the boot from creaking. A sole-tack is put through the centre at the toe end, as at *A* (Fig. 94), another at *B*, and two others at *c* and *c*. The sole is tapped all over with the hammer, and the boot held firmly on the knees by the strap which passes across the centre of the waist, a little below *B*, and under the left toe. The waist at either side should be treated with a waist- or cramp-hammer, which has a rounded face.

In very strong work the waist of the sole is left to the full substance; but this depends greatly upon the kind of wear such boots are to be subjected to, and also the desire of those who will have to wear them. When left in this way, and stitched through close to the edge, it is called a square waist, and is suitable for riding and other strong boots. Usually the thickness of the sole is reduced off the flesh side at either side—not the whole way across. The sole is placed flat upon a board, grain side down, and a skiver taken off from *D* to *D*, and (by turning the sole the reverse way round) another from *E* to *E*, leaving the skivers a little thicker at *F* and *F*. When placed upon the boot, these dark-shaded pieces, *F* and *F*, will be next to the welt, not on top, as here shown.

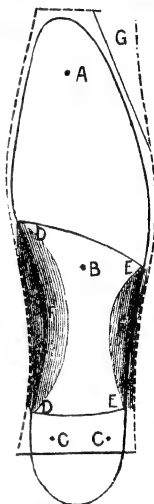


Fig. 94.—Sole.

When thus prepared, and the work has been hammered to make the bottom quite smooth and level, it can be taken off the knees. A piece of blunt bone or hard wood run right round between the upper and the welt will make the welt level, and cause it to set flat against the sole. If well rounded up before the sole is put on, the boot will form a good guide to the shape that the sole should be, which has now to be rounded up.

Roundin<sup>g</sup> or knifing-up the sole is a part of the

work needing care and attention, since it is this shaping-up which makes the difference between boots well finished and badly finished.

The boot should be held firmly with the left hand upon its side on the knees. The knife must be very sharp, and held in the right hand. The point should

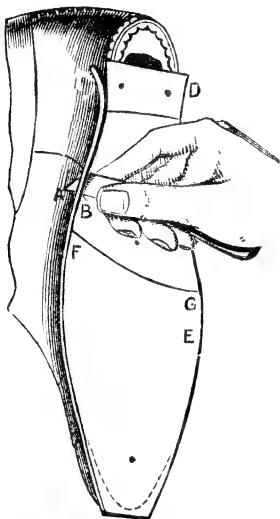


Fig. 95.—Rounding up the Sole.

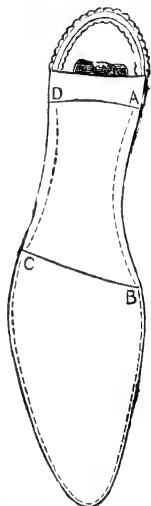


Fig. 96 —Channel for the Stitches.

lie on the first finger, the thumb on the top of the blade, and the rest with the handle held firmly in the hand. The point should overhang the side of the finger only just the substance of the sole, and not as shown at **A** in Fig. 95, which would cut the upper of the boot. The finger is kept against the sole, as shown at point **B**, and forms a guard to the knife. The piece (**C**) need not be taken off at one cut ; so as not to go too far, it can be pared in very small pieces, and the shape of the boot obtained gradually.

This paring is continued all round, but at **C** and **D**

the leather will be wanted to make the seat with and to cover the stitches; so the cut must not be close. As the upper does not overhang the sole so much towards the toe, more liberty may be given to the knife. The welt and sole should be pared closer at *e* than at *f* (Fig. 95); starting very close at *g*, it becomes gradually wider until reaching *f*, and similarly narrower until reaching *b*, and the ends of the waist *c* and *d* should match.

Great care is necessary to make and keep the edge quite even and square. This is the only opportunity now left to give the fore part of the boot shape and form, and this should be done consistently with the shape the heel is to be. A channel is cut round the sole to contain the stitches with which it is sewn to the welt. It will be seen by the dotted line in Fig. 96 that this channel has to be cut very near the edge round the fore part, from *b* to *c*, and it is wider in the waist from *a* to *b* and *c* to *d*. This line can be marked with a pair of compasses, about  $\frac{1}{8}$  in. from the edge in the fore part and about  $\frac{1}{4}$  in. in the waist. Another way of marking the fore part is by filing off the sharp edge of the sole so that the edge of the bevel on the grain will form a line.

The sole is channelled by holding the boot firmly with the left hand between the knees. The knife must be very sharp at the point, it should not be wide, and it is held in the right hand, as we hold a pen, only a little more upright. The third and little finger should be free. The tip of the second finger is placed on the face of the sole at the extreme edge. The knife is then dug into the leather at *a* (Fig. 96), and the third and little fingers are used against the edge of the sole and welt to steady the movement of the hand while the knife is being passed round the sole.

We have already shown on page 90 how to hold the knife, and how its position should be at an angle of  $50^{\circ}$  with the flat of the welt. The point of the knife should pass through the grain of the leather and into the fibrous portions sufficiently to allow the thread to be

well embedded in it. This will be nearly half-way through the leather ; but it is the substance of the sole that decides the thickness of thread which shall lie in this channel. The thread, lying in the firm part of the leather in this way, leaves the grain free to form a

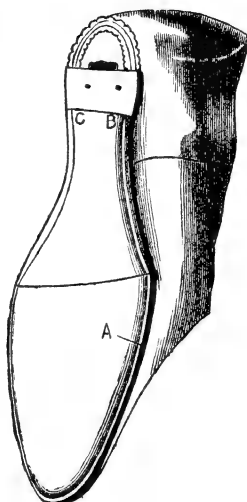


Fig. 97.—Channel laid open.

covering for the stitch when the channel is laid down.

Care must be taken with the waist, as the leather has been thinned down ; and if the knife should go more than half-way through, it would not hold the stitch, and so the entire sole would be spoiled.

The channel can be opened with any blunt instrument, but the prick-stitch (Fig. 79) is best. Put the point in at B (Fig. 97), and open the channel the whole way round, as shown at A, until C is reached. In doing this, do not disturb the edge, but throw the grain on top quite back so as to allow the stitching-awl to pass through without cutting. If cut, it would make the

channel harder to lay down, and cause an unsightly appearance in the finishing.

The bone can now be rubbed round the welt, and it is ready for stitching with a thread made as directed on p. 60.

In many boots and shoes the stitches on the welt side are shown up yellow. For this result, yellow flax is used to make the thread, and white wax or beeswax to wax it. If the ordinary shoemaker's brown wax is used, the flax must be waxed very sparingly indeed. Slate flax is very good for stitching, if the stitch is required to show black ; but whatever material is used to

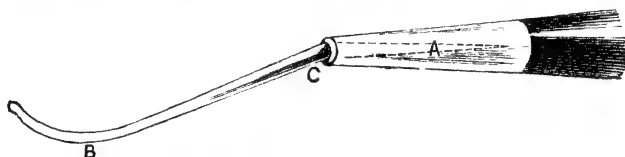


Fig. 98.—Stitching Awl.

form the thread it will need to be twisted lighter than sewing-thread, and should be a firm wiry thread.

Before commencing to stitch the sole, run the fudge wheel round to make impressions upon the welt, then you will be able to set a nice, regular stitch by placing the awl carefully into each mark made by the fudge wheel.

In making a boot you may sew and need not necessarily stitch the waist, or even the fore-part ; but it is better to do so, since it makes the work much more solid. Should you sew the boot, either for quickness or because you find a difficulty in using the stitching awl, the seam will be much stronger if you use a small sewing awl the side of which has been rubbed off a little on the emery stick. Stitching is stronger than sewing because the stitches are got closer together than in sewing, and a much smaller hole is made owing to the shape of the awl and the way it is used. »

Before putting the awl through for the first time, place the strap over the waist of the boot and the left

knee. The boot should lie on the lap, the toe towards you, with the upper to the right and the sole to the left. the knees being held together quite firmly. With the thumb-nail of the left hand the channel can be opened for a length of about 2 in. This is to prevent the

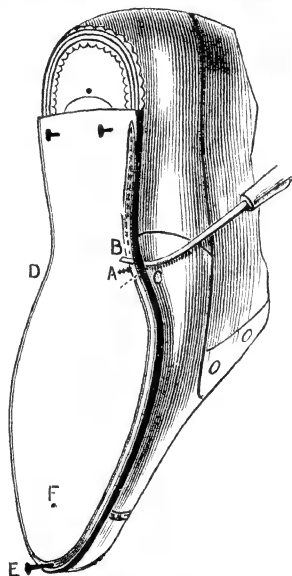


Fig. 99.—Stitching the Boot.

stitching awl (Fig. 98) from cutting or notching the thin piece of grain thrown up to form this channel, and which, if cut, would be very unsightly when laid down and finished.

The stitching awl (Fig. 98) is a tool made like the sewing awl, which is illustrated in Fig. 57, p. 57. It is put into a handle similar, only a little smaller. The differences between the sewing and the stitching-awl are pointed out on p. 57, where the blade of the latter is shown without the handle. As shown at A (Fig. 98), the point has a drop or pitch from B to C. As already

explained this awl must not be wriggled, as the sewing-awl is, but passed right through by one rapid and almost straight jerk, the boot being held firmly or the awl will break. There are also other kinds of awls used by shoemakers, such as the heel-awl, the use of which is explained on p. 104, and the pegging-awl which is referred to on p. 110.

Assuming the waist has been stitched or sewn, let us see how to stitch the fore-part from the point where you set the fudge on the welt. The left thumb is pressed against A (Fig. 99), just beyond where the awl is coming out, as shown by B. The curved part of the awl is laid on the upper, as seen at C (Fig. 99), with the point against the flat of the welt. It must then be pushed

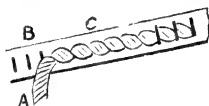


Fig. 100.—Making the Stitch

through by one sharp thrust, dropping the elbow while doing so, and sending the point through to the other side of A, and into the pit of the channel. Then the awl must be pulled out quickly, and in the same way, but this time raising the elbow.

The way the stitch is set depends, to some extent, upon whether the work is to be "pricked up," "fudged," left plain, which is called a "blind-welt," or the stitch sunk, and the welt fudged to imitate stitching. For the first two it will have to be set up boldly by over-casting the stitch, letting the end of the thread in the right hand pass under the stitch during the whole time it is being set, as at A (Fig. 100), until it is finally pulled to the same tension as the other stitches. The three black lines at B show the mark of the fudge wheel, where the awl is to be put through each time. The part at C shows how the stitch is each time thrown the same way.

For a blind welt direction of the stitch and thread



can be reversed, and so much care need not be taken with the work. The stitch shown in Fig. 100 wants learning, and this is the best place to get the practice. To sink the stitch in order to fudge it, take the sewing awl, lay it on the upper as though you were going to sew, and, with the point against the welt, draw it

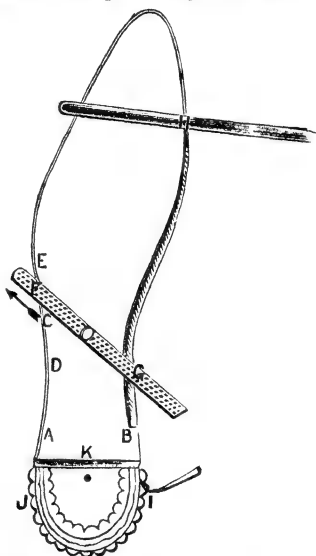


Fig. 101.—Rubbing the Channel down.

round the welt from *c* to *D* (Fig. 99), letting it cut a channel in the welt the depth of the grain, and in the place where the stitches are to be set.

The stitching can be proceeded with, opening about every inch or so of the channel with the left thumb-nail, at the same time putting a little wax on the thread on the left side. This process is continued the whole way round, pulling out the nail at *E* when you come to it. This nail is placed in the channel to avoid a mark or hole at *F*, where the tack is generally put, and a peg or piece of leather afterwards used to fill up.

The stitches that lie in the channel must be rubbed down the whole way round with a piece of bone, and a little paste is rubbed in, so that there is a thin uniform coat all round inside the channel. This is done by placing a piece of old soft rag over the right thumb, and putting the nail in the channel and rubbing it from one end to the other.

The boot is held between the knees, heel towards the worker, and the channel is lightly laid down by passing the smoother side of an old file over it from A to B (Fig. 101), holding the file one end in each hand, and taking strokes from A to C, and D to E, and so on. Move the file in an outward direction, as indicated by the arrow, starting contact at F and finishing at G. This will throw over the edge as a burr the narrow margin of grain made in cutting the channel. This burr is thrown back again by the action of the back of the knife on the edge of the sole, used as the file on the top. Then the boot is turned round, and the knife is held in the right hand and the boot in the left, the blade of the knife being flat on the sole. In this position it is passed round to cut off this burr level with the face of the sole.

The sole is then slightly damped all over and rubbed down with a long-stick made from a piece of round box-wood, about a foot long, smoothed by rubbing with fine sandpaper. The sole is worked down by well rubbing all round the seam, as at H, and then the centre. The long-stick must be passed over the leather briskly, but not so as to generate heat and thus injure the grain. For this process the boot has to be held firmly between the knees, the long-stick is used as the file was, one end in each hand. The stick must form a right angle with the channel, and the rubbing must be done with the centre of it, as at H. When this is done, and the bottom is smooth, the stitches on the welt can be lightly rubbed down with the bone, and the sole also hammered all over until it is perfectly even. A round-faced hammer is necessary for the waist, this part being nicely hammered.

So that the wax of the thread will not stick to the sewing awl, the point is thrust occasionally into a piece of soap. The awl is then passed under each stitch, which fastens together the sole and upper, as at I—not very far, but sufficiently to make the tight stitches lie in loops a little way from the upper, as at I, J.

The end of the sole is filed about A, B (Fig. 101), to throw the grain up and make it smooth. The edge K is also made straight. The leather to make the seat-piece must be cut straight at one edge, and filed on one side. The two pieces are pasted, the edges put together, and a nail placed at A (Fig. 102), then about five pegs are

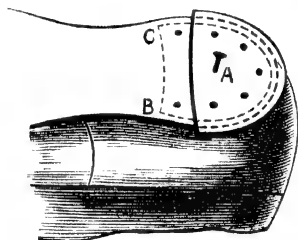


Fig. 102.—Sole-piece.

driven in the sole-piece, and two in the sole; these pegs are indicated by the seven dots on Fig. 102. The piece is then pared to the shape required, as shown by the dotted line. Plenty of stuff is left all round to overhang the stitches  $\frac{1}{4}$  in. The angle must be taken off round, for a third or bare half of the thickness of the leather, to the inside dotted line on Fig. 102. The nail A is drawn, the tops of the pegs taken off, the grain of the leather cut away round them, and from the whole of the top, from B to C, but most away where the pegs are driven. These pegs should be  $\frac{1}{2}$  in. from the edge all round, and when the cutting away has been done, the leather can be rasped to make it rough, though fairly level,

## CHAPTER VII.

## MAKING THE HEEL.

THE split-lifts to form the heel are made from a piece of butt leather, generally first-cut, as it requires to be tight, and must be supple. The piece should be about 7 in. long and 1 in. wide ; this, split down the centre while quite wet, makes a pair.

The splitting is done as follows :—Place the leather (Fig. 103), grain side up, on a board held upon the knees, let the left-hand thumb rest at A, and the little finger at B. With the first, second, and third fingers press upon the leather to keep the part marked c firm on the board. The knife, held in a slanting position, is put in at D, on top, and passed through to E on the other side. The knife is drawn along the dotted line D until it reaches F, with the point on the lower side, and following the dotted line c to A. This splitting gives two wedge-shaped strips of leather, A, B, as shown (Fig. 104). If not made quite to this shape while splitting, trim them up afterwards. One strip is then laid on the lap-iron, with the thin edge towards the worker. The left thumb is placed upon A (Fig. 104), and the right upon B, with thumb-nails towards you, the hands back to back, and the two fore-fingers against c and D. In this way the thumbs can be pressed very hard, and the two ends of the strip brought round to the dotted shape E and F. The thin edge will pucker up in the centre (G and H), but the puckers are hammered flat by tapping round the centre while holding the two ends between the thumb and finger of the left hand. Thus one split-lift is made, and the process



Fig. 103.  
—Cutting  
Split-  
lifts.

must be repeated for the other. The leather to make split-lifts must be split while wet, but it is best to let the strips dry a little before blocking them on the lap-iron. In drying they open a little at the ends, as shown

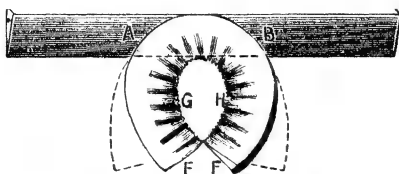


Fig. 104.—Turning the Split-lift.

by the dotted lines. For this reason the ends are brought together when making, in order that they may dry the proper shape.

The heel, as shown in Fig. 102, is rasped off and made

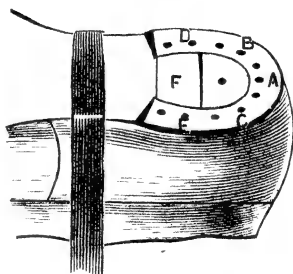


Fig. 105.—Split-lift in position.

rough so as to receive a thin coat of paste the same width as the split-lift, which is rasped on one side and treated similarly; it is then put on as shown in Fig. 105, the boot being held firmly, the heel end on the right and the toe on the left knee, by the strap passing over the waist and between the knees.

The split-lift is placed with its edge flush with the edge of the centre of the seat-piece at A. A peg is driven in, another at B one at C, then one at D. and

another at **E**. These pegs will keep the split-lift in its place while other pegs are being put in between them ; all must be placed towards the centre, as far away from the edge as the thickness of the split-lift will admit.

This is then nicely pared round. If a gent's or lady's square-heel boot, the outside corner should be left square ; towards the back and inside corner it can slant in somewhat. The tops of the pegs may be cut off, the top rasped as was the seat, and the two ends trimmed. A piece of zinc slipped under the end previous to

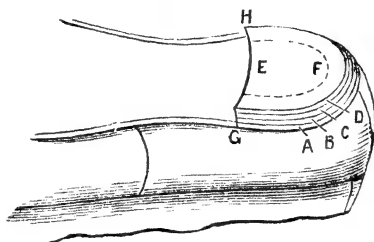


Fig. 106 — Heel ready for Sewing.

cutting protects the grain of the sole from being scored in the process.

The split-lift being now pegged in its proper place on the seat, the top of it is roughed with a rasp and pasted. The first entire lift, after roughing and pasting the flesh side, is then put on grain side upwards. The size for each lift piece should be got by placing a piece of paper over the split-lift. Then stroke the paper over the edge of the split-lift, until the edge of the heel is shown. This pattern will do for roughing out all the lifts for a square heel, and they should be a little larger than the pattern. If a smart (hollowed) heel is to be made, each successive lift may be a little smaller than the one on which it lies. For the present boot only two whole lifts are wanted to make the heel, shown in Fig. 106, **A** being the sole and seat-pieces, **B** the split-lift, and **C** and **D** the first and second whole lifts. In putting on the first lift, about five pegs can be inserted midway

between the centre and edge, as was done in the split-lift, the top of the pegs being cut off with a portion of the lift. The top is rasped unt'l nearly all the grain is off the leather, then it is trimmed to the shape of the heel. The second lift is then roughed, the two surfaces pasted, and the lift placed and kept where it belongs on the heel by driving in two  $\frac{1}{4}$  rivets at E and F; or two sole tacks may be used temporarily, and then withdrawn when the sewing down has been done. At the breast of the heel the first lift should overhang the ends of the split-lifts a little, and the second should

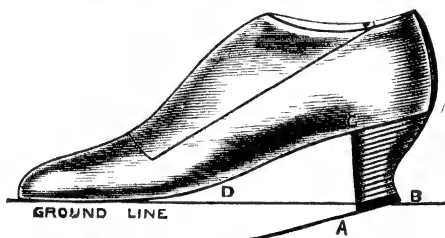


Fig. 107.—Flat Waisted Last.

overhang the first, and so on, until the heel is the height required, and the top piece is on. A channel, shown by the dotted line, must be cut in this top lift. If a second cut be made an eighth of an inch from the first, with the knife held slanting the reverse way, it will cut a V-piece out and form a groove, which need not be deep, for the stitch to lie in. The sole and seat-piece should be rubbed round from G to H with the bone to open it a little, so that the seat stitches may be clear.

If the last is out of range for the height of heel you wish to make, it can be counteracted by feathering the insole, and sewing close and full, unless the last is very badly out, when its construction must be altered. All the full lines circumscribing the lasts in Figs. 107, 108, and 109 are alike; and it will be seen by Fig. 107 that the last is somewhat dead, or flat in the waist. By building a high heel, one lift above the other, without reducing

them at the breast, the heel will be thrown out of range, as shown at A, B, and C (Fig. 107). If to give a better range the lifts are reduced at the breast when the boot is worn, the pressure of the foot on D will press it down to

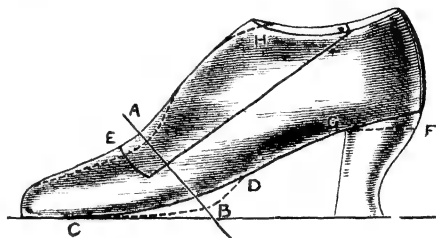


Fig. 108.—Alteration of Last for High Heels.

the ground line, and again throw the heel out of range. To prevent this, there are two ways to fit up the last, and if it fits someone, and will be again wanted to make low-heeled boots upon with little trouble, the alteration will

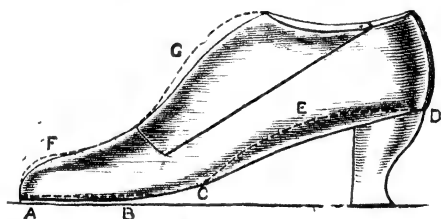


Fig. 109.—Another Way of altering Last.

be best made in a way that the last may be quickly brought back to the original shape. To do this, take the measure of the last round the joints at A B (Fig. 108), and then peg a piece of wetted leather on the bottom and right across the last from C to D; skive the leather, as shown by the dotted line B, tapering to nothing at C and D, but less abrupt from B to C than from B to D. Rasp away the wood at A E, as shown by the dotted line, until the new measurement is the same as first.



taken. Peg on the heel a piece of leather, thick at F, and tapered to nothing at G. A little wood can be taken off at H, and if the lasts are to be used for high-heeled boots only, it will be the best. Rasp off the bottom

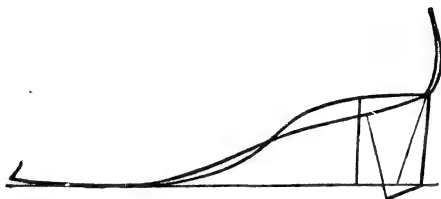


Fig. 110.—Heels Contrasted.

at the toe a piece from A to B (Fig. 109), as shown by the dotted line, and also from C to D, taking away most at E; this deficiency can be made up with leather at F and G. The two diagrams given in Fig. 110 contrast the

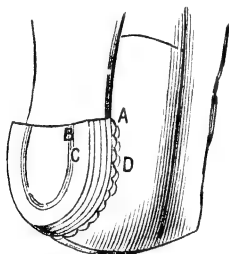


Fig. 111.—Stitching the Lift.

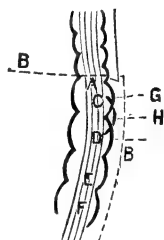


Fig. 112.—Method of Making the Stitch.

pitches of the same heel on the different-shaped lasts.

To sew down the heel the boot is placed on the knees with the heel towards you, and the lifts to the left, as shown in Fig. 111, and held very firmly by the strap. The thread for the heel should be about four or six strands stouter than sewing thread. The heel awl is a tool nearly straight, but in other respects like the sewing-awl. It is used in a large-sized sewing-awl handle, and before making each hole the blade needs to

be dipped into soap. It has a thick substance to go through, so the leather must be sufficiently moist, and good bristles are wanted on the thread.

To make the first hole for sewing the heel, the awl is put in at A (Fig. 111) and brought out at B. The exact place where the point of the awl is to be put in the sole is shown in Fig. 112, which is a section of the welt and seat. The heel is indicated by the dotted lines B B, and the first hole is made at near A the corner of the heel, and the thread is drawn half-way through. In the same way the second hole is made at C. In making all the holes after the first, the awl must be kept clear of the seat stitch (Fig. 112), as this might impoverish the stitch and make it somewhat rotten. After the second hole is made, the point of the awl is placed under the seat stitch to raise it in line with the mouth of the hole, so that the sewing thread may pass through the loop of the seat stitch. The stitch is made by passing through the two bristles from opposite ends of the hole one after the other. The two ends are then drawn through together, pulling the thread hard on both ends. The third hole is made in the same way by putting the awl in at D, and the sewing process is repeated. This will make a stitch as seen at H, coming out of loop G, and returning into loop I; and when the stitch is drawn tight it draws the upper to the sole, and also holds the heel on. This process is repeated, each hole following on as at E and F, until all the stitches that lie on the upper leather are sewn down. The stitches in Figs. 111 and 112 are shown loose to clearly illustrate their positions. The heel thread should fall into the groove cut on the top of the heel, the last stitch being finished off with a knot. After each few stitches are set the heel should be hammered down to keep it in its place. When the heel is sewn all round, and the ends of the thread cut off, it can be firmly and well hammered down all over.

Now when the leather is damp and workable is the time to make the seat; and after it has been hammered

on top, the stitches  $\Delta D$  (Fig. 111) should be rubbed down well with the bone. The heel can then be dressed carefully with the pene end of the hammer, so that in the process all the stitches are covered by the leather. In commencing, the pene of the hammer must strike the heel at the bottom of the split-lift and the top of the sole and sole-piece, as shown in Fig. 113. This is to drive the leather over the stitches as much as possible. When this pening has been done all round the heel, turn the boot and commence at the extreme edge B, holding the boot in the position shown; and when hammering

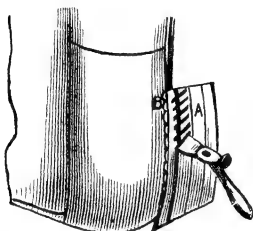


Fig. 113.—Pening to cover the Stitch.

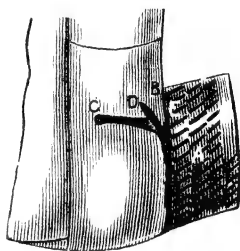


Fig. 114.—Trimming the Seat.

towards the back, let the toe slip between the knees. The blows of the hammer do not want to be hard, but sharp and frequent, and repeated in various rows all round the edge of the heel, as at  $\Delta$  (Fig. 114), leaving no part untouched. Then the leather can be slightly flattened with the face of the hammer.

The next step is to trim the rough edges of the seat at B. Hold the boot firmly upon the knees (as at Fig. 114), and just start cutting with the point of the knife; and to save it from slipping into the upper, a metal guard will be found very useful. The handle of an old metal spoon hammered thin and flat (as A, Fig. 115) makes a handy guard to the knife for several purposes. This guard is placed on the upper, as at C, and moved along with the knife when cutting off the

rough edge D. The seat is trimmed up, so that E is left firm and solid, and well covering the stitch. The next process is running the seat-breaker (Fig. 116) round from the other corner of the seat. In the illustration A is the cutter, B the guard, C the handle. The guard B is put against the top of the seat at the opposite corner to B (Fig. 114), and, taking three or four sweeping strokes in one direction only, the seat should be made smooth and even all round. If it is not, the lumps must be cut off with the knife, and the breaker used again. This finishes the edge E; and the edge B must now be rubbed round with the welt file (Fig. 117), used for smoothing the welt,



Fig. 115.—Metal Guard used when Trimming.



Fig. 116.—Seat breaker.

etc., made with cross-cuts on one side only (as illustrated). The heel can be allowed to dry, and it can then have the remainder of the lifts put on.

If a pegged seat is wanted, it must be arranged for before the boot is lasted, as it is necessary to skive the stiffener (Fig. 74) much thinner and more tapered than is wanted for a sewn seat. The inner sole is not fitted and holed as described on p. 72 (Fig. 78), but it is left quite square and plain to the edge, to where the heel is coming; the waist and fore-part only are holed. The seat portion is left its full substance, and it will be found that even then the centre is higher than the sides, unless the bottom of the last is very flat at the heel—which it should not be, as this will make the boot feel very uncomfortable to the heel in wear.

A pair of thin split-lifts about  $\frac{1}{4}$  in. wide must be

made, as described on p. 100, to go round the edge of the inner sole. The thickness that these split-lifts should be must be decided by the amount of drop that the last has at the edge, as their purpose is to make the top as near flat and level as possible. The split-lift can be pegged on with a few short fine pegs, so that in pegging the seat the sole and all the upper leather and stiffener should lie quite flat. Pegs should go through everything inner included ; otherwise they are never solid, and tend to yield to any strain from top and bottom ; so pegs must go straight through each substance, and not on the slant. Fig. 118 is a section of the seat, upper, stiffener,



Fig. 117.—Welt File.

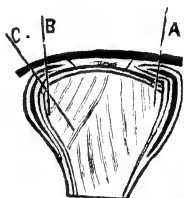


Fig. 118.—Pegging a Seat

inner sole, split-lift, and sole, with the right side with the split-lift, and the left without. The difference between a peg that is driven through straight, as the line A, and the one driven aslant, as the line C, can be easily seen. To get upon the leather on the left the same effect as shown by the line A, the peg would have to be driven as the line C, which is not nearly so strong as A.

When the inner sole is prepared, the top can be lasted round the seat as described on pp. 75-77, excepting that the lower edge of the upper leather must reach towards the centre fully  $\frac{3}{4}$  in. more than is needed for a sewn seat. Bought tops are generally quite large enough to allow this, without making the golosh too low at the back ; but tops not large enough must be sewn. There are several ways of sewing the upper to the inner sole ; but this is not done as described for a sewn seat. The upper leather can be stitched by felling to the inner

sole, or the stitch can be set, first on the sole side and then on the upper ; but that is not solid enough for good work, as too much depends upon the pegs.

The best method is as follows :—Hold the boot as for stitching the sewn heel, with the heel towards you (see Fig. 119). The sewing awl is put in at A, the point is brought out at B, and a thread is put through and halved. The awl is next put in at C and brought out at D ; this is a little on the slant, and the remainder of the holes can follow the alternate dots from side to side

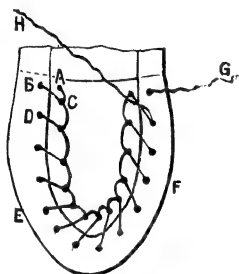


Fig. 119.—Seat Sewn for Pegging.

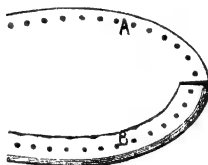


Fig. 120.—Pegged Seat and Split-lift.

in like manner. The stitch is set like this : the thread end hanging from B is held in the left hand, and when the hole C D is made the end at A is put into C ; B is then put between A C under the thread that is going to form the stitch across these two holes. The thread A is then drawn out with the left hand at D, and the thread B drawn through under the stitch A C. This will draw the upper over at B. The next stitch is set in the same manner, which will draw D over, and so on right round. Each time a stitch is set it can be hammered down or top and at the side ; this drives the stiffener into its place, and helps to make a nice square edge, shown by the line E F, to form the seat upon. By the diagram (Fig. 119) it can be seen at the last stitch that the two ends G and H tied together will make a good finish,

with a solid and smooth seam, and that the top is flat to receive the sole.

The sole and sole-piece are put on as with a sewn boot, only they are pared nearer to the upper, leaving about  $\frac{1}{8}$  in. all round. A row of fine pegs, just long enough to go through the inner sole, is put in (as shown by A, Fig. 120) near to the edge of the sole and sole-piece; and they must reach the edge of the inner sole and just go through it. A straight fine awl is like an ordinary fine bradawl, it should be used with a short stumpy handle; and if the leather be too hard for it to be forced

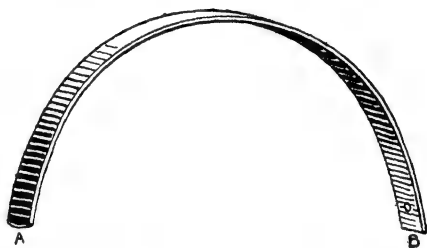


Fig. 121.—Flexura Spring.

in by hand pressure, it can be held in its place with the left, and driven in with a hammer in the right. The tops of the pegs must be cut off, rasped, and pasted, ready to receive the split-lifts, as described on p. 101. When the split-lift is put on, it must have a row of pegs put round, as in Fig. 120, only they must not be quite so near the edge, as shown by B. The first lift is treated in the way described on p. 101, and, with these exceptions, all is the same, as with a sewn seat.

A steel spring inserted in each waist is useful for those who like a boot or shoe to fit close under the waist and instep, or for those who have a flat foot and want to improve it. This spring need not be so strong as to hurt the foot; and at first wearing it is best to have springs very little curved, and stiff enough to keep the waist from dropping by the weight of the body. As you get used to them, a spring more flexible, yet

stronger, can be used. There are several kinds of springs—single, double, twins, Goodyear's, etc.; but a good strong single spring will answer the best, using women's or men's as wanted. Flexura springs can be got at almost any grindery shop. The price is from 3d. to 6d. per pair, or say up to 5s. 4d. per dozen. Two pieces of brass or zinc for the plates, and about eight copper tacks, should be included with each pair. Fig. 121 shows their shape; they are about  $4\frac{1}{2}$  in. long, and  $\frac{1}{2}$  in. to  $\frac{3}{4}$  in. wide; this is before they go in the boot. They will not need padding, as the spring should not be strong enough to hurt the foot. Should this happen, it can be prevented by bending the spring back very gently at first, and increasing as you proceed, so as to make the spring nearly straight and yet not to break it.

To put the springs in, the boot is unfastened after the inner sole is fitted, and put on the lap-iron to have riveted upon it a plate of brass or zinc. This plate of metal has three holes made in it; it is laid upon the flesh side of the inner sole, as at A (Fig. 122), and three holes are pierced with a fine awl in the inner sole. The place for the end of the spring is just below the end of the waist, as shown. If it is put nearer the ball of the foot, the steel will work through the metal plate and the leather also, and thus let water in before the other parts of the boot are half worn out.

Then lay the sole on a board, and from the grain side drive three copper tacks through, so that the heads are well into the grain and smooth with the leather. Take the shoe off the board and put it with the tack heads flat on the lap-iron. Put the plate of metal over the points of the tacks, and hammer it down to the leather. Cut the points off near to the plate, and, while the heads

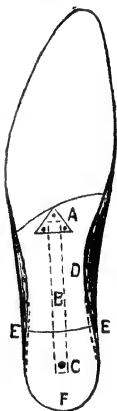


Fig. 122.—  
Inner Sole  
for Pegged  
Waist.



are flat on the iron, gently burr or rivet the ends to fix the plate very solid.

Proceed, as previously described, with making until the welt is in and the seat and waist sewn down; then the steel spring is put in. It has a hole through one end only, c (Fig. 122). The other end, A, is put under the metal plate, as shown by the dotted lines in Fig. 122, a tack is put through the hole c in the spring, and when the boot is made it can be cut off and riveted in the same way that was done for the plate. This is usually

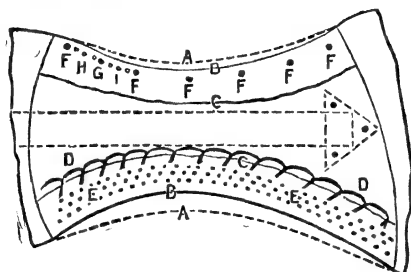


Fig. 123.—Pegged Waist Enlarged.

enough to hold the spring, but a few stitches can be put across from side to side if it needs it.

The boot is then proceeded with as before described; but no welt is wanted in the waist if it is to be made pegged, which, if done properly, is by far the best for a flexura spring waist.

In fitting the inner sole for a *pegged waist* the waist is skived at the edges only, and not very far in, excepting at the centre of the inside waist (as D), where the outer sole will have a greater curve, and still allow the pegs to be put in, so that they will go through the whole substance of the leather. For the pegged seat more upper leather is wanted to last over than for sewn work, and this can be sewn down as described for the seat.

For a pegged waist the sole need not be made thinner in the waist than for a sewn one, unless it is very stout; and in that case, it can be thinned

uniformly from the grain side ; so that, although the waist is thinner than the sole, it is all the same substance. Assuming that the sole is stitched on and the seat pegged, we have only to peg the waist. This is very important work, for if the waists once give way they are exceedingly difficult to repair.

A diagram of the waist is given in Fig. 123 on a larger scale to show the essential points. The dotted lines A and A show the inner sole. The full lines B and B show where the outer sole is to be rounded up. The lines C and C show the edge of the upper leather, and D D show the stitches that hold it in its place, which are like those in the seat. If the flexura spring should require further fastening, the stitches D, D can be drawn from one side to the other. E E show where three

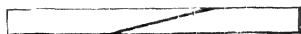


Fig. 124.—Split Strip for light Pegged Work.

rows of pegs should be put in. About six holes, marked F, F, F, F, F, F, should be made in each side, and as each hole is made a peg should be put in. This holds the waist in its place. Then between each two of these another peg can be put in, as at G. The remaining holes necessary to complete one row are made, as shown at H I ; each one is pegged as it is made. When one row of pegs are in, trim off the tops with the knife or rasp before putting in the second row, and proceed the same with the second row if you intend to put a third, which will be necessary for heavy work.

For making light pegged work there need not be a middle sole, as a simple runner will suffice. Measure from joint to joint on the fore-part ; select a piece of firm leather, first-cut is best, and cut it to this length, and about  $1\frac{1}{2}$  in. wide. Split this strip down the centre as in making a split-lift ; the cut, being  $\frac{1}{2}$  in. wide (as shown in Fig. 124), will give on each side  $\frac{1}{2}$  in. width of solid stuff to peg through. Skive the strip a little wider and thinner at the toe, so that you may get it round

smoother. Hammer it, peg it on, cut the pegs off, skive it down towards the centre, and fill the bottom up in the ordinary way. By this means it may be made as flat or round as you choose. No matter how broad the bottoms are intended to be, the pegs must be far enough from the edge to go through quite  $\frac{1}{8}$  in. from the edge of the insole. It will be found best to slant the edge with an ordinary knife, but be very careful not to cut the upper. Hold in the left hand the piece being cut away, twist it between the thumb and finger, and only use the extreme point of the knife, guided by the second finger of the right hand. The fore-part iron will do for smoothing with as for sewn boots.

The heel was left, on p. 101, built up to the second

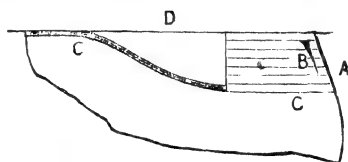


Fig. 125.—Completing the Heel.

whole lift, A (Fig. 125). To make a  $1\frac{1}{4}$  in. heel will need two more lifts and the top piece. The top of A should be roughed with the rasp, and pasted, and the third lift laid on and secured by two rivets nearly in the centre; this is also rasped and pasted, and the last or top lift put on. This lift is rasped and pasted, and also the flesh side of the top piece, which is held firm by headless rivets put in at A and B (Fig. 126), so that it may be rounded up. The heel can be rounded up to whatever shape may be desired. Fig. 126 is a medium heel; it can be built smarter, or quite square, as the dotted lines show in A and B; either way, it should be longer and more square on the outside corner C (Fig. 126), which in this case shows the right heel. The remainder of the rivets can be put in not very near the edge, as D and E (Fig. 126). They should slant outward all round, as A (Fig. 125)

To blind on the top piece drive six blinders, or headless rivets, down the side of those at A, D, and F (Fig. 126), as shown there by the small dots. Prior to pasting the top lift these blinders are put in, leaving enough to go through about two-thirds or three quarters of the substance of the top piece. The top piece is laid on and hammered down, causing these portions of rivets to embed themselves into it, and so hold it on. For very light work, or when the wearer objects to his heels making a noise in walking, blinders can be put in all round, and other nails need not be used ; but then the top piece wears out quicker than if it has nails or



Fig. 126.—Shape of Lifts for Blinding.

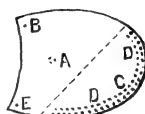


Fig. 127.—Top Piece Bradded.

brads in it. The system has one advantage—that heels need not be worn down badly, as it is not much trouble to slip this piece off, knock another on, and pare it up and finish. It need be renewed only as far as it is worn ; therefore it is as well to put this top piece on in two pieces, joined as shown by the dotted line (Fig. 127), when only the part C need be slipped off and replaced.

The position for the brads is as shown at C (Fig. 127), being on the outside of the heel, unless the wearer treads inside, when the heels should be bradded on the inside. The top piece should be left about  $\frac{1}{8}$  in. wider where the brads are to go, leaving something to trim off. By this means the brads are got quite to the edge of the top piece, where the hardest wear comes. One, two, or three rows of brads or rivets can be put in, according to the strength of the boot ; a third row need only reach from D to D, the inner row being the shortest.

Most of the care necessary to give symmetry to the bottom of the boot lies in fitting the inner sole and

sewing in the welt and seat ; and to have a boot well ranged, this must be kept in mind. The inner sole must be so arranged that when the heel is built to its full height, and the top piece on, a straight-edge placed

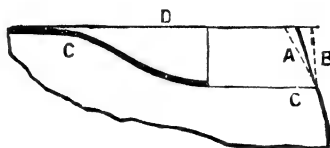


Fig. 123.—Pitch of Heel

as shown by the line D (Figs. 125 and 128) will show that the flat of the top piece is level with the flat part of the sole.

This plan line of the inner sole's edge may be thrown out of level, as shown in Fig. 129, by the dotted line A,

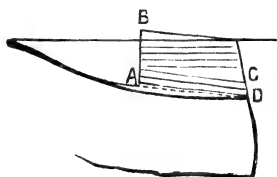


Fig. 129. —Heel Pitching on Waist.

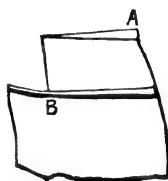


Fig. 130.—Heel Pitching on Back.

through sewing the welt and seat corners too snug, as the dotted lines E E show in Fig. 122. Raising the point of the sewing-awl here and dropping it at F will make a heel built lift upon lift too high in front, as at B (Fig. 129) ; to make it stand flat upon the ground a wedge-lift would be put in, as at c. The reason for this is that the last is round at the bottom of the heel, it being highest at c (Fig. 122) and lowest at F and E E. The closer the two dotted lines E E, the higher they are, as at A (Fig. 129), and the more they are sewn down at F (Fig. 122), the lower they are at D (Fig. 129), and this gives the result explained. If the reverse is done it will

make a heel too high at the back, as shown by *A* (Fig. 130); but this fault is not nearly such a bad one as the other, except in a spring waist; then the spring would raise the waist and pitch the back of the heel so prominently as to make it very uncomfortable in wear.

From Fig. 131 can be seen the importance of having this line a curve sweeping towards the heel, and straight at the sole. The way certain lasts have to be fitted for particular types of feet sometimes makes it difficult to do the fore-part in nicely; but it should range

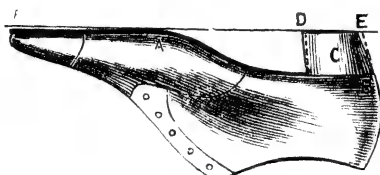


Fig. 131.—Correct Range for Spring Waist on Last.

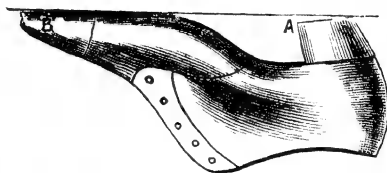
correctly at least from the waist to the heel, as from *A* to *B*.

A heel dropping, as at *B* (Fig. 130), which makes it look higher in breast than at the back, or rising at *A* (Fig. 129), which makes it look higher at the back than at the breast, is very unsightly, and throws the boot or shoe out of position in wear. It is this sort of heel which gets worn down at the front, *B E* (Fig. 128), and also causes the waist to drop, as though the wearer had a flat foot. The effect is that the upper part is drawn out of place, and wrinkles are made on the instep of the boot, making it appear old with only a very little wear.

The range of the heel has a certain effect upon the pitch, because a little defect in the range can to a certain extent be set right by properly pitching a heel; but it is not advisable here to dwell upon makeshifts to overcome defects, as the aim is to show how to be boot-makers, not boot-doctors. Therefore, remember that

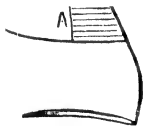
range depends upon pitch, and pitch upon the form of heel.

A gent's ordinary military heel (Fig. 131) should be pitched as *c*, unless the boot has a spring waist ; then it can be pitched as shown by the dotted lines *D* and *E*. When off the last, and also when on the foot, the waist

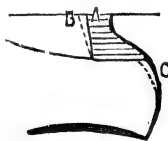


**Fig. 132.**—Spring Waist off the Last.

will have a tendency to rise, and so pitch the heel forward, as shown by *A* (Fig. 132). The spring waist will also have the effect of making the toe lie flat on the ground as at *B*, which adds beauty to the boot or shoe. The higher the heel, the more forward it wants to



**Fig. 133.**—Square Military Heel.



**Fig 134.**—Smart Military Heel.

be pitched, as *A* (Fig. 133) ; or for a lady's as shown at *A* (Fig. 134). An extra smart high heel could come even as far as the dotted line *B*. The last should then have more drop in the waist, and more off the bottom of the back of the heel, as at the dotted line *c*.

The shape for a heel is to a great extent a matter of fancy, though some heels would look out of place on certain work. A boot for heavy wear should have a

square-shaped heel. A light dress-boot can have a small top piece. For ladies, even if the heel is smart, it is best to have the top piece somewhat large. Low heels are best for walking, riding, shooting, or for any purpose where the wearer is likely to be long on the feet. For light walking-dress wear there is no objection to high heels providing the wearer knows how to walk on them which very few persons do.



## CHAPTER VIII.

## KNIFING-UP AND FINISHING.

Now "all the stuff is on"; and the next process is knifing-up, which is the paring off of all surplus stuff that may be on the edge, waist, or heel, and the whole process that gives the finishing touches to the shape of the boot. It is by skilful knifing that the desired shape is got to the heels, as the concave shape seen in a very hollow or smart heel could not be got by rasping.

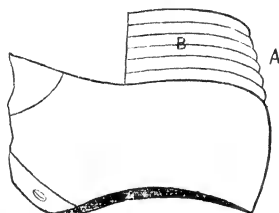


Fig. 135.—Heel in the Rough.

The heel with all the stuff on is very rough round the edge, as at A (Fig. 135). Before taking this off, round up the top piece to the required shape, as explained on page 89, for the soles. The boot is now held very firmly on the right arm, holding the heel in the hand, but leaving the side B free to work upon. In the knifing-up commence from A, in Fig. 136, not touching the top piece nor the seat B. The position of the hand and knife are shown at c and d, and the action of paring is to drop the hand and raise the knife. The more hollow the heel is to be, the deeper is the knife dug in, the more the hand is dropped and the knife raised in the second half of the cut. This process is continued all round roughly, and then gone over a second and third time, each time taking off the bumps left between the former

cuts. If necessary, the process must be repeated a fourth and fifth time, or until the bumps are so small that by passing the finger over the surface they can be

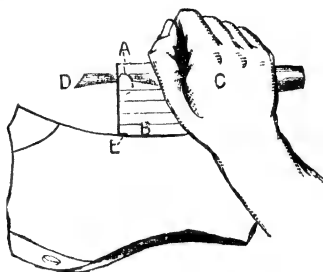


Fig. 136.—Knifing-up the Heel.

scarcely felt. At this stage do not touch the seat, and so avoid cutting the upper; the top half of B is pared round very carefully by itself afterwards. To save an

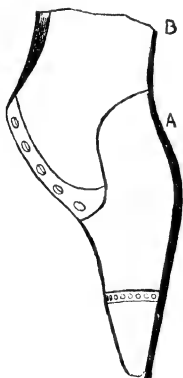


Fig. 137.—Paring Waist and Buffing Edge.

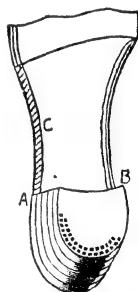


Fig. 138.—Peening Waist and Breaking Heel Corners.

accident while doing this, it is advisable to put a piece of horn or bone at E, between the upper and seat, to prevent the knife from slipping into the upper.

Holding the shoe on top of the knees, with the edge

up, as Fig. 137, the edge of the sole is now knifed-up with the knife in the right hand, the point only between the thumb and finger, as shown by B (Fig. 95, page 90), commencing at A (Fig. 137), and going round to the joint on the other side. Only little shavings are taken off, for the sole has been already shaped; all that now remains is to make the edge quite square.

To prepare for knifing-up the waist, the corners A and B (Fig. 138) must be well knocked down by means of a corner-beater or welt-beater, which is made by heating an old file, turning it back for about a third of the way, and while hot beating it up square, at A and B



Fig. 139.  
Corner-beater.



Fig. 140.  
Another form of Corner-beater

(Fig. 139), on the lap-iron, with a hammer. Another form for a corner-beater is shown at Fig. 140. When it is the shape required, heat it again, and put it into cold water, and when dry, brighten it a little with emery cloth and temper it by reheating till the brightened part turns blue.

The corners are knocked down by putting a corner-beater (Fig. 140), right into the corner of the heel and waist, at A or B, and hammering it well down until a decided corner is made to the heel. While this is being done, the boot is held in the position shown by Fig. 138, by the stirrup, firm upon the knees. Then hammer each side of the waist with the peen end of the waist or cramp hammer; this will knock the edge of the waist over, to cover the stitch, and also make it lie closer to the upper. This process will leave marks at C; but a second row of taps, made with the peen of the hammer held so that these lines shall cross the others, will make the edge more even, and also very firm at the side of the stitches. The waist can now be hammered along each

side with the face of the hammer, and with the knife, held in the hand as shown in Fig. 136, nicely trim each side to make it round and even.

To peen the heel, hold the boot as Fig. 141, and hammer the heel all round at A, as shown by the short strokes. In this process, as in the knifing-up, there is no need to touch the seat or the top piece. This peening is continued till every part of the heel that was touched with the knife has been hammered, and then a extra touch up with the face of the hammer will make the heel ready to be rasped.

The Yankee heel-shave (Fig. 143), which costs 4/6 in

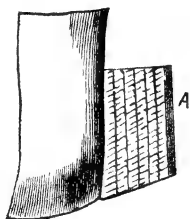


Fig. 141.—Peening the Heel.

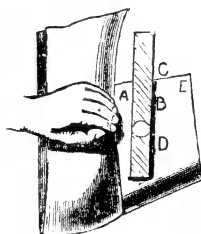


Fig. 142.—Rasping the Heel.

an iron frame, is used before and after the heel is peened, and will be found to save a lot of labour ; the handle, A, is placed in the left hand, and B in the right ; C is the blade, or cutting iron ; D D are screws by which the cut of the iron is adjusted. The boot is held firmly between the knees, and the tool acts as a woodworker's spoke-shave. Held in the fingers with the two thumbs pressed upon the heel, it will be found that a very even stroke can be made by opening and closing the hand.

The edge of the sole can now be peened ; this wants to be done very carefully, as all the tools that follow depend upon this having been done in a proper way. The centre of the sole's edge is made hollow, as shown at Fig. 144, therefore the peen of the hammer must not touch either the welt edge A or the sole edge B. The

sole edge must be struck only on the centre, where the sole and welt meet at c and d. Here is shown how the edge should be hit, and this should be continued all round.

A shoemaker's rasp used for smoothing has one side cut as a file ; but the rasp side is now used, and this has one end flat, and the other round. For the edge of the sole use the round side, and use the flat for the heel, unless it has to be hollowed, then the round is used. In rasping with the flat part upon the heel, the boot is held, as in Fig. 142, upon the knees, and the fingers A are kept as a guard over the edge of the seat that this

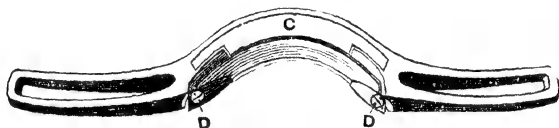


Fig. 143.—Yankee Heel Shave.

part may not be touched, while the rasp B is rubbed lengthways, in a direction from c to d ; and while making each stroke, throw the rasp to the right, to give it a diagonal motion from A to E, and continue this all round, except on the seat and top-piece, until the heel is quite smooth. The fingers must be passed round to feel that it is even, and then the file side of the rasp can be used in a similar fashion.

The edge of the sole must then be rasped. The position of the rasp is shown at A in Fig. 145. The thumb of the right hand must lie along it, so that its tip is at A, the extreme end of the rasp. The hand is closed to hold it quite firm, and the tips of all the fingers, except the little one, will lie against the bottom of the sole at B, and so form a guard whilst rasping all round the sole. Held like this, the rasp is rubbed up and down, from c to d, for about three inches at a stroke, touching only the centre of the sole edge, and keeping clear of the welt edge E and the sole edge F, as the edge when finished

should be hollow, as at *G*. The edge is filed or rasped in the centre only, because the join of the welt and sole at *H* is the only portion of it that is hard, as the edges *E* and *F* are only the grain side of the welt and of the sole. The edge can be filled finally in like manner with the smooth side of the rasp; it should be finished level, and with the hollow nice and even all round.

The sole-plane (Fig. 146), which costs 3s., is not in any way hard to use. It will be seen that *A* forms a rest and *B* a guard; under *B* is the knife *C*. In use, *B* is



Fig. 144.—Peening Edge of Sole.

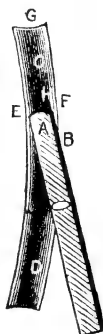


Fig. 145.—Rasping Edge of Sole.

run on the edge in the same way that any other plane would be used, putting equal pressure on all round, or a little extra where most is needed off. This is an exceedingly good tool for a novice to use, as with it he cannot do much damage, whereas with the knife he can soon spoil a boot.

With a very fine file again go all over the surfaces that have been rasped, more particularly at the heel. The process is as described above, so nothing further need be said about it here, only that it requires to be done well.

The top of the top piece of the heel can be well filed with the file side of the rasp. The boot is held between the knees, in the position of Fig. 138, or reversed with the toe towards you; it must be held very firmly, with the

stirrup over the waist, and the file also must be held very firmly. That part where the nails are driven will want most filing, as the nails make this part highest, if the heel is built solid; the heel should be smooth and straight, and the edges left quite square.

Previous to using the buffing-knife, which is described on this page, damp the edge of the sole, and lay the boot on its side to lie on your lap, with the sole towards you, and the toe towards the right. The buffing-knife *D* (Fig. 147) is held between the thumb and finger of the right hand, the other fingers, shown at *A*, are put

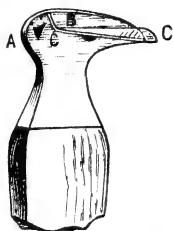


Fig. 146.—Sole-plane.

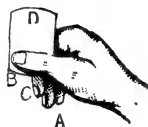


Fig. 147.—Shoemaker's Buffing-knife.

on to the edge of the sole, the corner *B* being on the edge, while the finger *C* rests on the bottom of the sole. The top end of the buffing-knife should lean a little to the right. The buffing should be done, as much as possible, in the centre of the edge, so as to keep it hollow, as in rasping. This process will throw a burr over at *E* and *F* (Fig. 145).

To sharpen a shoemaker's buffing-knife, run it through a piece of tallow, lay it flat on a board with the edge to be sharpened flush with the right-hand side edge of the board, and hold the knife on firmly by pressing all four fingers of the left hand upon it. With the stem of a sewing-awl, a stiletto, or a steel burnisher, rub the edge backwards and forwards. This will throw a burr over the edge. Turn the knife over, and repeat the process on the other side. Now hold the knife in the left hand,

edge upwards, and letting the awl run on both the burrs at the same time, draw it from the centre to the corner; keep stroking the edge till it is flat. This will throw the burrs over the sides, and they will have a keen edge. Each time the buffing-knife is sharpened, it throws over a little more steel. Do not let other tools come in contact with it, as they may damage its edge.

For buffing the heel the buffing-knife is held in the same way, excepting that the three fingers *A* (Fig. 147) are closed up to the palm of the hand. The knuckles will act as a rest to the knife while it is scraping the edge of the heel. If desired, the process of buffing the heel may be deferred till after the seat is set.

Sand-papering is the next process, and a troublesome one it may prove if the sand-paper is not soft, even, and used in the proper place. To do the sand-papering of the sole, the boot can be held in the position of Fig. 137 for the last half, and in the reverse direction for the first half. A sheet of sand paper costs a penny, and folded uniformly it will make sixteen handy pieces. Double one of these rough side out, and hold it between the thumb and finger, as the buffing-knife in Fig. 145, except that the three fingers and the forefinger are closed in the palm of the hand, holding the paper between the thumb and the knuckle of the forefinger, and so far from the edge as to leave the paper under the thumb only. Supposing *D* to be the sand-paper, the folded edge should be at *B*, and being used upon the forepart, this edge must be nearest to the upper; but it must not touch it, nor must the hollowness in the edge be in the least interfered with.

To sand-paper the heels the boot is held as at Fig. 142. The fingers may rest on the upper in the position shown, so that it cannot get rubbed; one of the small pieces of sand-paper is then placed across the fingers of the right hand, one end is slipped between the first and second finger, and the other between the third and fourth. The tips of the two middle fingers then form a pad for the paper to rest on, while the first and little fingers



hold it firm. It is then rubbed round the heel like the rasp was, again being careful of the two edges. A new piece of sand-paper, size  $1\frac{1}{2}$  in., should be used first, and an old piece used to finish with.

When the edge of the waist was peened as at c (Fig. 138), the process ought to have knocked the welt very close to the upper. With the boot in the position shown in Fig. 137, hold the knife upright, and, commencing at the heel, and coming down to where the sole begins to get thick (A), cut away the edge of this welt in the waist. It will be only a very narrow strip, and as it was skived very thin, it will not be hard to cut. You must not cut very near the stitches, and take care not to slit the upper. With the boot in the reverse position, the same process is done on the other side in the same way,



Fig. 148.—Welt-Knife.

only this is done so that the sole c (Fig. 138) shall itself form the edge of the waist, which will then be solid.

When this has been done, rub the bone round the waist, pene it down a little more, and repeat the action with the round head of the hammer, working all over until it is even and smooth. Then again trim the edge, keeping it a good shape, with the knife upright, so that on each margin the sole leather is of equal width from the upper. If it is then smooth, buff the waist all over, and afterwards sand-paper it.

Levelling the welt comes next, and this is best done with the welt-knife, though it can be accomplished with an ordinary knife, placing the first finger of the right hand so that the blade tip and the finger tip form a V, and in this form the knife can be run round the welt without touching the upper. But if a welt-knife (Fig. 148) is used, the welt can be trimmed well and easily, as A forms the knife, and B the guard to protect the upper, and if this tool is sharp it can be used with perfect ease,

to prepare for a double iron (Fig. 157), should this be desired.

Breasting the heels—by which is meant the trimming up of the front of the heels—adds much beauty to a boot, and is one of the many points that makes shoe-making an art. For gentlemen's work, the breast is often cut straight across, as from A to B (Fig. 149), and for heavy work this is not objectionable; but for light work, or ladies', the boot or shoe is not properly finished until the

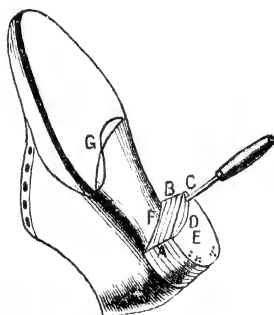


Fig. 149.—Breasting the Heel and Marking the Waist.

breasting is done. Previous to breasting, straighten the sides or corners of the heel, so that you may know where to commence each stroke and where to finish it; or the heel may be cut straight across, as from A to B (Fig. 149). Either way, the corners A and B must be straight from the seat to the top-piece.

To breast out the heel a good sharp, stiff, narrow knife will be needed. This knife must be put in at C, and one sweep along the line D will take a piece, as E, out of the top-piece. Next comes the top lift, and this is cut away in front similarly with one sweeping curve. This is easier, as the leather is not so hard, and the curvature of the top-piece serves as a guide to rest the blade of the knife against while it is cutting. This process is continued till all the lifts are cut away; but with the bottom lift F be very careful to cut only

just through it, and to avoid scoring the waist of the sole. The two ends of the split-lift can be cut away by a light pressure of the knife.

To make up the seat after the seat has been nicely pared up, damp the leather and use the seat breaker, rubbing it evenly round the seat (Fig. 150) from A on the near corner to B on the far corner of the heel. The seat must be knifed-up very cleanly, as shown from A to C, all the stitches being entirely covered, and the extreme edge of the seat A C being close to the upper leather D. Following the breaker the seat-file

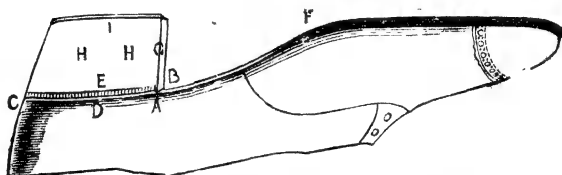


Fig. 150.—Sole, Waist, and Top piece set up.

can be passed round the edge of the seat from A to B, to make it quite level where trimmed up. Then give it another rub with sand-paper should it need it.

Slightly damp the edge of the seat again, and warm the seat-wheel (Fig. 151), but do not make it so hot that it would fizzle if put into water. Run the seat-wheel evenly round, so that it leaves at E (Fig. 150) one straight line of regular indentations.

A seat-wheel is shown in section at Fig. 151. By looking at this illustration, it will be seen that A is the guard, which runs between the upper and seat at D (Fig. 150), while B, the wheel, rotates and makes the marks at E, in Fig. 150.

Using waist-iron next, start at F (Fig. 150), and run it up and down, taking strokes of about 2 in., until B is reached; then finish the corner nicely, lightly press the iron down at A, and so finish the corner of the heel G, and by doing so finish the wheel marks E, so that

none are to be seen at B ; and the process must be repeated on the further side.

The leg of a common chair will make a very good

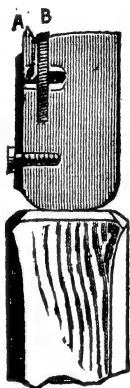


Fig. 151.—Seat-wheel.

handle for a waist-iron as shown at Fig. 152. The iron is placed in the handle at A, and the boot rests upon the



Fig. 152.—Handle for Waist-iron made from a chair leg.

knees, in the position shown in Fig. 147. It can be held by the left hand while the iron is held at B, with the right ; the end, C, can be placed against the right shoulder to form a centre, with the handle as the radius ; describe an arc from F to A upon the edge of the waist (Fig. 147). This gives the iron a sweeping curve, which is necessary to give a good result.

There are many kinds of waist-irons, as also of most other sorts of irons ; but you need not be hampered with a quantity of tools, but may procure only those needed

as you progress with the work. To make a square waist, an iron similar to a double iron is used ; for other waists, irons are used according to the shape required. These

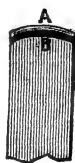


Fig. 153.—Hollow  
Waist-iron.

Fig. 154.—Side-view  
of Waist-iron.

Fig. 155.—Round  
Waist-iron.

irons can be made from the ends of old files ; these can be driven into handles, like Fig. 152. Figs. 153 and 155 are two of the most useful ; one is concave, and the

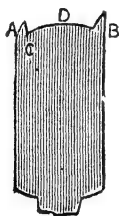


Fig. 156.—Blind Double  
Iron.

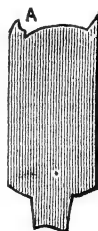


Fig. 157.—Double  
Iron.

other convex. Both must be convex from the front, as shown in Fig. 154, where A is the guard, and B the part of the iron which sets up the edge.

A double iron has two guards, marked A and B (Fig. 156), and A lies or runs on the welt, while B is on the top of the sole. So in ironing C will form a thin crease on the edge of the welt ; and if the iron is held firm, D

will keep the edge hollow. This iron must be run very evenly, and must commence on the side opposite to the joint *r* (Fig. 150); it is run round the toe, and finished at *e*, on the near side. If not broken off too suddenly this will give a nice finish to the waist-iron, that started at this point.

In a forepart, iron shown at Figs. 158 and 159, the

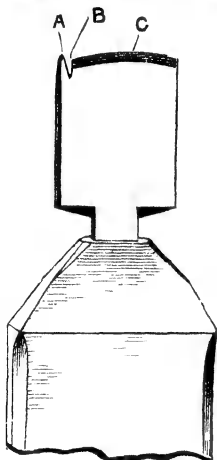


Fig. 158  
Forepart iron Front and Side Views.

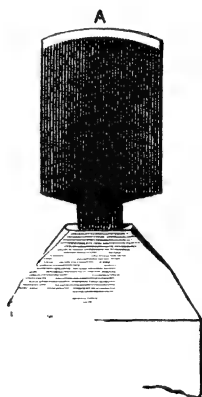


Fig. 159.

guard must be shaped as *A*, the crease as *B*, and the face as *C*; this is done with very fine kit files. The face and guard can be cut with a three-cornered file; the face must be dome-shaped, as shown in Figs. 158 and 159; the top of the guard must be parallel to and about a  $\frac{1}{4}$  in. above the face. A fine thin crease file will cut the crease *B*; this should be about  $\frac{1}{8}$  in. deep. A piece of soft sole leather oiled, and with some powdered emery on it, will soon put a smooth even face on the forepart iron.

If the stitches are to be pricked up or fudged, Fig. 157 is used in exactly the same way. It is slightly

different in shape, for at A there is a little shoulder just above the crease, to give an even finish and sharp edge to the welt. This will remedy any irregularity made by the prick-stitch or fudge-wheel.

If a double iron is to be used, the edge of the work must be specially prepared. The way in which a boot is stitched to a certain extent governs the shape of the iron to be used. For blind welts, Fig. 149 will be suitable.

With regard to ironing, to get a good result in either sewn or stitched work, the forepart iron must be applied only on the sole side. The welt iron is to be used only

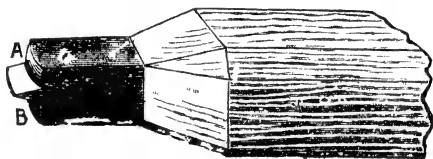


Fig. 160.—Double Iron.

on the welt side (from joint to joint), and it is often called a jigger-iron. The bevelled appearance is given to boot soles with this iron (or this may be done with the jigger side of a double iron).

A welt iron is used for the welt-side of the sole's edge, and a forepart iron is used for the under-side only, and serves the purposes of both these tools. A double iron, shown at Fig. 157, is a welt and forepart iron combined; but it is much harder to learn to use.

These irons should be only just warm, and the leather must be slightly dampened before the iron is used, so as to give the edge a nice, polished, dark brown surface.

The whole edge of the heel H H (Fig. 150) can then be ironed in the same way, only this is done with the glazing or big iron (Fig. 30, p. 29). A good-shaped glazer has one end longer and thinner than the other; so that in ironing the waist it is easier to get in the breast of

the heel at *r* (Fig. 149) ; and other parts of the work are facilitated as well. This iron can be applied in a direction from *H* to *H*, or *E* to *I* (Fig. 150) ; but it must make no indentation to rob the surface of its truth. The top-piece iron is the next iron to apply. It is similar to a fore-part iron, only the face is not quite so round. This iron is run round the top-piece, and throws a crease at *i* (Fig. 150). It gives a keen finish all round, and it may also be run up each side at *a*.

The fudge-wheel, as will be seen by *A*, at Fig. 161, makes the stitches, or what represents them, appear nice

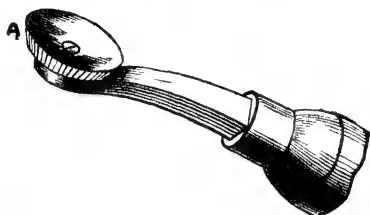


Fig. 161.—Improved Fudge-wheel.

and regular, which adds beauty to a boot. The fudge is finished off with the shoulder of the double iron *A* (Fig. 157), when the edge is ironed ; this shoulder will also finish off the prick-stitch when the stitch is pricked up.

Fig. 161 shows an improved fudge-wheel, the shape of which enables it to be used more freely than the one shown at Fig. 61. As the wheel is tapering, its prominent edge will run much closer under the upper at that particular part which is marked *A*.

A prick-stitch and how to make it is described on page 73, and on page 95 is shown, in Fig. 100, an enlarged section of stitching meant to be pricked up. The same is shown on a smaller scale at *B* (Fig. 162). Here the point of the prick-stitch (Fig. 79) must be pressed between every stitch, which makes a mark like the fudge, only that it throws up each separate stitch, and forms them into a row like little beads, instead of making a series of



raised ridges from the edge of the sole to the upper, as the fudge would have done. Fig. 162 shows the position of the boot for pricking up the stitch, and this is commenced at c, while fudging would be started on the opposite side of the sole.

A blind welt will only want to be smoothed round with a dull knife and left plain, but not so wide, as at D. A welt that is half wide, three-quarter wide, or wide must be pricked up, or fudged, to look at all well.

Marking off the waist is done simply to show the extremity of the waist, and how far to black when it is a

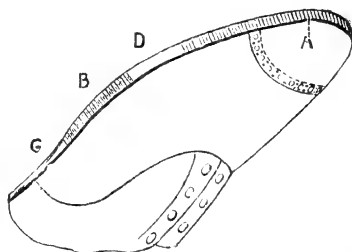


Fig. 162.—Position of Boot for Pricking up the Stitch.

black waist. It can be done in various forms to suit the taste. Two—the curve and double twirl—are shown at G (Fig. 149). All irons used in finishing a pair of boots should be applied prior to the colour going on.

Putting the soles into colour is the next process, by which is meant putting the ink on. If they have been ironed, as just described, it is necessary to first rub on a little weak soda and warm water, or weak ammonia and water, the parts to be made black to make the ink take, or strike, as it is technically termed. The parts are then inked according to fancy—that is, the welt, edge, waist, heel, seat, etc. American ink is best diluted with an equal quantity of water. If the leather is not ironed while in the brown, the soda-water or ammonia-water will not be needed; but a little thin paste or gum is run over to make the edges smooth to receive the ink, and

prevent it opening the pores of the leather. Either must be used very sparingly. When the boots have been got into colour, let them get only just dry, when they will be ready to iron. If American ink was used this will be when nearly the whole of the inked parts will have turned blue.

In all ironing, the boot or shoe must be held very firmly upon the knees, and the irons must be only slightly hot, or they will wrinkle the edge and spoil it; therefore the iron will want a continuation of heating all through the process. Take great care of

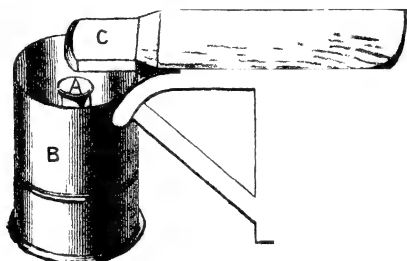


Fig. 163.—Spirit Lamp for Heating Irons.

all irons, for if they get damaged, it will be useless to expect them to work well and leave a keen edge behind them.

So that your irons will not get smoked and dirty your work, the proper way to heat them is either over a spirit-lamp or a specially prepared atmospheric gas-jet which burns only with a blue flame. If the irons have to be heated in a fire be very careful, or the handles may be burnt. Even though the irons are heated in this way, it is well to have an old piece of rag just to wipe them on each time before using.

Fig. 163 is a shilling spirit lamp made for this purpose, A being a cap fitting the burner, to prevent evaporation of the spirit; B, a rim fitting on the lamp to support the stand, while the iron C is being heated.

Heating the irons will waste time unless while using the small irons the glazer is kept just warm enough to be used on the waist and the heel during the intervals while the small ones are getting hot.

The irons must be held very firmly in the right hand, and upright so that only the centre part touches the leather, otherwise the surface will be roughed through the edges of the irons dragging. They must press very hardly, but uniformly, all over the leather, or they will make hills and dales of what should be a plane. The way to use the irons, so that one will give a finishing stroke to the other, has been explained—this course must be adhered to both in the second and third ironing. These are a repetition of that explained as the first, only that the work is black instead of brown; all parts must be well ironed, so that there is not a patch of dull black left anywhere.

When a good gloss has been got on all parts, heat over your lamp one side of a hard heel-ball, and while this is in a semi-liquid state dab small portions of it all over the ironed portions, excepting just round the seat where the seat-wheel is set. Then, with the irons a degree cooler than before, repeat the two previous operations at the same time, ironing the heel-ball evenly all over. The irons must be warm enough to soften the heel-ball with a very little pressure, or indentations will be made in the leather, and the edges and surface spoiled.

In all ironing it is well to habitually use a certain method, so that you may have an instinctive conception of results, and save repeating an operation unnecessarily. Use glazing iron (Fig. 30, p. 29) first, then wheel (Fig. 151), so that the former shall not destroy the latter. Now using the waist-iron (Fig. 153), press it a little harder at the end of the waists and into the corner of the seats, and so give a decided finish to waist, and also press out any marks that the wheel may have made, thus giving the seat the appearance of having had each piece nicely finished at its corners.

Now use the prick-stitch (Fig. 79) if the stitches are to be pricked up; if fudged, use the fudge-wheel (Fig. 161); if blind welts, smooth down with a dull knife. Then setting the double iron (Figs. 157 and 160) round the edge will finish off either of these, and if neither started nor finished off too abruptly this will give a nice finish to the waist-iron also.

The heel-ball spread over all the blacked parts will want cleaning off with a cloth—a piece of old beaver or kersey is about the best for this purpose, though other kinds will do. This cloth is doubled, and then placed over your right thumb, the ends are brought round so that you can hold them firmly in the hand, and so make a smooth pad of cloth upon the thumb, as Fig. 164, and



Fig. 164.—Holding Heel-ball Cloth.

with this rub the parts where the heel-ball is, and continue gently rubbing till the whole of it is cleaned off, leaving a smooth, even, glossy surface. This process can then be repeated with an old piece of soft rag held in the same way.

The bottoms and top-pieces of stout work are sometimes made black, and if finished in this way they look very nice if done well. Other styles are also given here.

For black bottoms, waists, and top-pieces the entire bottom will have to be scraped with the buffing-knife, and sand-papered till it is very smooth. Then a little tan paste or gum should be rubbed over it carefully to

make it smooth. When dry, it can be polished all over with a cold burnisher or a boxwood long-stick. Then ink it in the same way as for the other parts.

The waists may be treated similarly, except that it is better in this case to use a hot burnisher, of the shape shown in Fig. 165. This is also easier to use than the

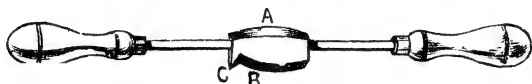


Fig. 165.--Double-handed Burnisher or Glazer.

glazing iron for this purpose, as a handle in each hand and the boot between the knees give much more power over the tool. The waist is heel-balled and finished in the same way as the edges.

Buff bottoms and waists, which are easily dirtied and easily cleaned, are made as just described, but stopping short of inking, and instead a little powdered pumice-stone is rubbed on, first with the face of the sand-paper, and then with the back of it.

Damped-down bottoms do not get dirty so quickly, and give a nice clean-looking finish; the process is a repetition of the above, only instead of paste or pumice the bottom is smoothed with a pad of damp, clean, white flannel.

White bottoms are prepared in the same way as buff ones, only instead of using pumice a little pipe-clay is scraped on, and sand-papered in, and when even all over, it is damped down with a piece of clean white flannel. Another coat of pipe-clay is then scraped over, and dabbed in with a dry part of the flannel. This will dry with a clean, white, smooth surface, and then any surplus pipe-clay can be rubbed off with the dry flannel.

Fiddle waists for light work look as clean and nice as any, and this process can be extended all over the bottom. This kind of waist is generally used with a

stripe-waist—that is, the parts A and B (Fig. 166), are made black. A light-coloured shoe is left brown, then the stripes can be made a little darker by the use of a warm iron. Fig. 167 shows a gent.'s boot, but a lady's looks even better, because the stripes can be made a little wider at A and B, which makes the waist look narrower and much smarter.

These waists must be buffed and sand-papered in

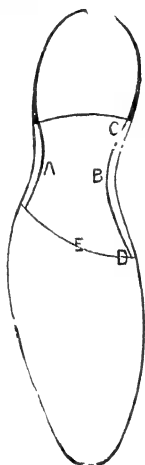


Fig. 166.—How to Mark Waist.

the usual way, and rubbed down with the back of the sand-paper to make them very smooth. A piece of clean white rag is drawn over the thumb of the right hand, as in Fig. 164, so that the rag is quite smooth on the cushion of the thumb. It can be held firmly with the forefinger, just under A. On this pad is put a little clean paste, and this is rubbed very lightly and very evenly all over the part to be fiddled. See that one place is not made damper than another, or the waist will look mottled when done. Instead of paste, this can also be done with a clear gum, or, better still, a

gum-dragon ; a pennyworth from the chemist's, put into a small jar, and covered with water, will be ready for use in a few hours.

When the waist is dry, rub it all over with a bone or long-stick, holding the boot firmly between the knees, and one end of the bone in each hand. Keep rubbing till the whole waist is nicely polished, then change the rag shown in Fig. 164 for a piece of clean cloth, and upon this rub some white glazing-ball (which is white heel-ball), and rub this all over the parts that have been covered with gum or paste until a good even creamy polish is got by rubbing evenly and briskly.

To make the stripe waist, the knife must be held as a pen in the right hand, and the boot in the left, with the toe towards you, as in Fig. 166. The point of the knife is then put in at c, and drawn round the line b to d. The position of the boot is then reversed, and the other side treated in a like manner, to make the line a. The knife must go only just through the grain of the leather, say  $\frac{1}{4}$  of an inch. Though the knife is held as a pen, the handle should point over the left shoulder, so that the burr or thin edge of the cut-up grain shall form a barrier to prevent the ink flowing on to the fiddled part while the stripes are being inked.

When the bottoms are finished by this method, the top-pieces may also be finished in the same way, or they may be made black. Another good finish is to use a little ink and a few pieces of oxalic acid, and rub them all over with the end of a wine cork ; this makes a bright red top-piece, the more ink used the darker it is, or a little water added makes it much lighter.

Spring waist, either pegged or sewn should be finished as follows :—After the ordinary ink is on and dried, a piece of damp rag is used to rub off all surplus ink or dross ; with the same rag rub a little Indian ink on all over the waist. When dry, in a minute or so after, rub it over with a dry cloth, and this will leave a smooth dull surface. This is ironed or lined across with a crease iron or a dull knife. With the former two or

three lines may be made at a time, but with the latter only one. As very few are used, the iron now is rather hard to obtain, the dull knife being as quick in the end. With this line the waist as shown in Fig. 167, commencing

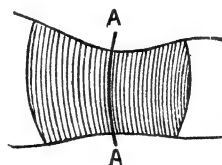


Fig. 167.—Creasing for Flexura Waist.

ing at the line A in the centre, and then making lines on either side until both ends are reached. When ironing up, give all the lines a finish by using the waist-iron up each side.

In marking off the length of the waist, as E (Fig. 166), the end of the line on either side is brought just over the commencement of the thick part of the edge and the end of the waist, as shown at A (Fig. 168.) The fudging or

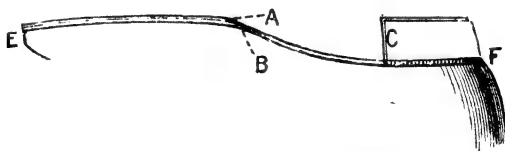


Fig. 168.—Section of Boot.

pricking-up of the stitch, should start at B, and the wheel top-piece iron (if used down the line c), and waist-iron should all finish at D. The line from E to F should have straight and even sweeps, the height of heel making a difference in these. These points help to make a boot look well.

The burnisher, or double-handled glazer (Fig 165), is a handy tool, as much more pressure can be got upon



it than on an ordinary iron, and being larger it holds the heat longer. The top at A can be used for the heels, top-piece, the bottom, and some part of the waist ; the side at B is used only for the heels, and the part C rests upon the top-piece. For making black bottoms this tool is almost indispensable. It is possible to make one by heating and beating out the teeth of an old half-round file, and rubbing it down smooth in the centre, and then putting another handle on the point.

When drawing the last out of lace boots, cut the stay stitches, which hold the two facings together on the instep. If button boots, undo the buttons and cut the stays at the edge of the fly lining. The screw of the block must be taken out and the last hook (Fig. 169) put

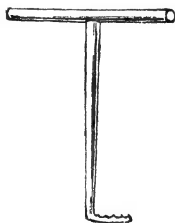


Fig. 169.—Last Hook.

in the hole in the side of the block, and it can then be drawn out. The hook can then be put in a hole made for it just over the heel the last ; the upper should be quite smooth, so that the last cannot catch it anywhere and tear the linings.

○ Your two feet must be put on the handle of the last hook, the boot should be held with the toe raised in the left hand, the heel of the boot can then be pulled off the last with the right hand. In doing this care must be taken not to break the waist, and it is sometimes necessary to pull the upper right back over the heel of the last, to save the waist from being bent. If the last is exceedingly hard to get out, it can be eased a little by

gently tapping it on either side of the forepart, but take care not to bruise the upper.

There is sure to be some roughness on the insides. When the waist or seats are not pegged, this can be removed by rubbing a peg-rasp (Fig. 170) over the rough



Fig. 170.—Round-headed Peg-Rasp.

place. If the insides are very rough, or when the seats or waists have been pegged, they must be well scraped with a peg-knife (Fig. 171) until all the points are off.



Fig. 171.—Peg-Knife.

Any nails inside should be knocked down previous to this process, or they will spoil the peg-knife. After the pegs are cut off, rub the whole of the inner-sole down with the peg-rasp. These two tools are very handy, as a pair of boots that have been worn some time often become uneven inside, and application of the peg-knife and peg-rasp may save a lot of discomfort.

Gent's boots or shoes will only want a seat-sock, as Fig. 172. For shoes lined with dry-dressed leather, a piece



Fig. 172.—Seat-sock for Gent's Boots.

so match it can be used for a sock. If oil-dressed, or if boots, a piece of cream roan or a piece of any coloured

morocco will do. They should be cut the shape of Fig 172, a trifle larger than the inner-sole, which is shown by the dotted lines. Both boots and shoes for ladies are socked right through, and this makes such a great difference to the finish of them. It is best when the fitting of the inner-sole is finished to take it off the last, lay it on a sheet of paper and cut this exactly to the sole (Fig.

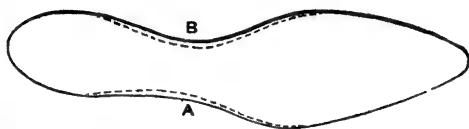


Fig. 173.—Sock for Ladies' Boots and Shoes.

173), except at A and B where it should be a little large, particularly at B, the inside waist.

Paste the socks on the wrong side of the leather, and only to within an eighth of an inch of the edge, as when the sock is pressed in the boot the paste is sure to work out to the edge, and if too much paste is used it will ooze out beyond, and if it comes in contact with the linings it makes them very dirty. A thin stick about a foot and a half long, tapered at one end, is used to put in socks. In this stick put a stout needle, passing the eye up into the wood so that there is only about a quarter of an inch left out. After the sock is pasted, put this needle point, from the paste side, through the toe of the sock, lay it along the paste side, as shown by Fig. 174, fold the sock, letting the clean side be at the



Fig. 174.—Putting in Sock not to Crease it.

top, the stick underneath, and the two paste sides nearly touching each other. By this simple means the toe of

the sock can be got right to the toe end of the boot, and the whole sock right in, without dirt or paste getting on the linings or top-bands. When the sock is up at the toe, press the boot on the top of the toe so as to hold the sock there while the point of the needle is drawn out, and when this is done, nicely lay the sock all over the inner-sole; see that it is in straight. Then put your hand in and smooth it down all over. If the leather for the socks is thick, it must be skived at the edge all round, but if not very thick, cut the socks face downwards, and hold the knife pretty fairly on the slant, letting the handle always incline towards the centre. When the sock is in there will not be a rough edge showing all round, as is the case sometimes.

To tap down the feather, take hold of the boot or shoe in the centre of the front or vamp with the left hand, and pinch it so that all the stuff is away from the sides, and while it is in this position, tap it down very lightly on either side with a smooth-headed hammer. This is to make the feather of the inner-sole even each side, and to lay it, with the upper, closer to the outer-sole, and so give it the appearance of having been worked closer than it really was.

Your boots or shoes are now ready to wear, with the exception of cleaning. A very thin coat of weak paste will save you a lot of trouble in cleaning calf. This should be put on while they are on the lasts, and while they are there the first coat of blacking will save a lot of trouble afterwards, as you can then well sleek them with a piece of smooth bone, to give them a smooth and even face. The foregoing instructions refer mainly to an ordinary pair of boots or shoes, a few incidental remarks and instructions as to spring waists, etc., being included.

## CHAPTER IX.

## MAKING RIVETED BOOTS AND SHOES.

WHEN once the principles of lasting, explained in Chapter V., are understood, the process of making riveted boots and shoes is by no means a difficult one. It is a very ready way, and also a very cheap way, of making a good strong covering for the foot.

Riveted work will need a last made of iron, or one having an iron bottom, which may be made by putting an iron plate upon an ordinary wooden last. If making for your own feet only, the latter would be best. If making for customers, buy iron lasts, one at a time, till a set of sizes is obtained. If making for your own children, who naturally grow out of boots very quickly, it is well to use an ordinary wooden last. In this case be very careful not to use the rivets too long, and when off the last, clench the rivets on a small iron foot.

On p. 64 will be found all the information needed for buying the lasts and fitting them up to the measure of the foot. A thin sheet of iron, as Fig. 175, with three holes in it, at A, A, and A, can be made to cover the

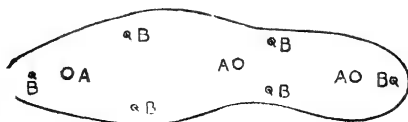


Fig. 175.—Thin Sheet Iron to cover Last.

whole of the bottom. The sheet-iron should be blocked so as to fit the last's bottom perfectly. It can be held

on by six screws, as shown by the six B's. This will allow the iron to be taken off when the last is wanted to make hand-sewn work on.

This sheet of iron would make the boots too large ; but this is remedied by putting a pair of extra inner soles, the thickness of the sheet-iron. These soles, blocked and dried on the last, make a pair of riveted boots as smooth as hand-sewn inside.

The inner sole proper is tacked at A, A, A. Fig 176,

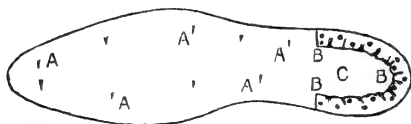


Fig. 176.—Boot Bottom with Blinders and Split-lift on Heel.

and rounded up to the last. It is skived down a little at the waist only, and then merely at the edge.

Chapter IV. (p. 70) gives information on buying the tops and sole leather ; but for riveted work welts are not wanted, but, instead, a piece of soft first-cut about 14 in. long and 2 in. wide. This treated like split-lifts will make a pair of runners. Proceed to wet and fit it as described for welts ; but it must be used nearly dry, and the stiffeners can be skived on the bottom the same as on the top.

The principles of lasting are the same as those described in Chapter V., to which reference should be made ; but for riveted work use very short tingles (miniature tin-tacks), in place of lasting tacks, and instead of these being put in as shown at B, B, D, D, and c (Fig. 87, p. 78), they are put in at the extreme edge of the overlapping leather, and are knocked right in and clenched. Also, in lasting for riveting, the heel of the last must be knocked into the top more at D (Fig. 84, p. 75), so that there is enough stuff for the rivets to catch while building the heel ; the heel should be lasted

in nearly as well as the toe, so that when the lasting is finished the upper should be quite smooth all round. The centre should be filled up with a little felt, and the whole bottom made flat and level all over. The way to put the felt and the shank-piece in the waist is described on p. 52.

For a boot of very light substance, the sole can now be put on ; but to make medium or stout boots, put on the runner, or put on a middle sole, and then skive the centre of it a little. If the runner is put on, it will need preparing in the same way as a split-lift, described on p. 99, only the twist will not be wanted up the sides, but merely at the toe end, or centre, of the runner. It must be tingled on all round, not using many tingles, and these as far from the edge as possible, so that while the sole is being put on, the rivets will not come in contact with and drive them through, and so tend to make the sole unsolid. The position of the runner is shown by A, B, C (Fig. 177), the ends can be skived off at A and C.

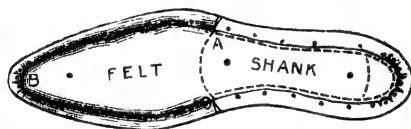


Fig. 177.—Boot Lasted ready for Riveting.

If a middle sole is used, it is put all over the forepart as far as A, C, where it will also want skiving. To fit the sole on while rounding it up, put in a few iron brads about  $\frac{1}{2}$  in. long—not rivets—and leave them projecting about  $\frac{1}{4}$  in., or little more, as shown by the short strokes near the A's in Fig. 176; file up these till they are somewhat pointed, then the centre and the edge can be pasted.

A pair of soles of inferior quality towards the heel would be less costly ; with these it is best to make the seat with a pair of good split-lifts instead of with the soles. The split-lifts can be bradded on, as shown by A,

B, E, with  $\frac{1}{2}$  in. brads, and they can be driven in and clenched. The runner or the split-lift can be rounded up all round, to within  $\frac{1}{8}$  in. of the upper. This allows enough in the forepart to imitate a welt and to make the seat at the heel.

The sole is now pasted, and laid on its place, and a brad driven in at c, Fig. 176. It can then be tapped down all over with the flat end of the hammer, first striking gently over each of the brads marked A, and then continuing till it is all flat and smooth, as Fig. 178.

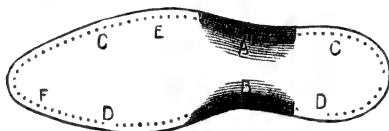


Fig. 178.—The Riveted Sole.

The sole is now rounded up to the runner and split-lift, and to within  $\frac{1}{2}$  in. of the upper at the waist on each side ; all this should be done to give as good form to the boot as possible.

The instruction to leave on  $\frac{1}{8}$  in. all round the forepart must be qualified. Do so, if the wearer wears straight ; if, however, he wears unevenly, leave the stuff a little full where the most wear comes, and trim it close on the other side.

Now rivet the sole on. If not used to driving rivets, make holes to receive them, and in doing this, and in driving the rivets, see that their points incline distinctly inward, or the rivets may run off the edge of the last instead of clenched. If the work is light, the holes can be made near to the edge, as the sole will in this case need to be a shade closer ; while for stout work the rivets can be a trifle farther from the edge of the sole. A second row may be put all round, or only at E and F ; but the single row even would be enough for light work.



If the heel part is not flat, it is better to put a second split-lift on the sole ; or the first whole lift may be put on, skiving away the centre till it fits. How to finish building the heels, and the way to brad the top piece, is described on pp. 114, 115.

If the boots have been made upon wood lasts, without iron on them, at this stage the last should be withdrawn, the whole of the bottom tapped down on the iron foot, and the last then replaced. The rivets may be driven with a hammer, but it is easier to do this with a beater, as shown on p. 122, or with a driver like Fig. 179, which is a patent rivet-driver (price 2s.



Fig. 179.—Rivet Driver.

made of hardened steel). A similar one can be made by heating an old long rasp, and beating it somewhat smooth, and then re-tempering it.

Knifing-up, rasping, buffing, sand-papering, etc., breasting heels, seat setting, finishing-off waist, setting-up fudge-wheel on welt (or runner in this case), putting into colour, and finishing, etc., are explained in Chapter VIII.

Having followed these directions, the boots are off the last, and all that is now necessary is to sock them. If made on last to the correct size, sock them as described on p. 146 ; if made upon the wood last with the extra iron bottom, sock them with a second inner sole. Take the sheet iron off the last, block the sock, let it dry, and then round and skive it up. Paste it well all over the flesh side, put it in the boot. Replace the last without the iron in the boot, and let the sock dry before taking out the last. French chalk can be shaken in the boot to prevent the last sticking to the sock and pulling it out.

While the boots are on the last they may be cleaned, as they will not be soiled by taking out the last this time.

To avoid repeating information that has already appeared, references have been given above to pages in which some of the processes connected with boot and shoe making are described.

In making riveted, pegged, or machine-sewn boots, the tops are cut longer and wider than they would be for hand-sewn work. From  $\frac{1}{4}$  in. to  $\frac{1}{2}$  in. more stuff is left on all round the bottom of the uppers. In this class of work the rivets, pegs, or stitches are nearer the centre of the sole than hand-sewing is. The welt is sewn in nearer the edge, and any upper leather above the seam has to be cut off close to the welt. As a rule, the leather is not subjected to any special treatment to soften it, though, if very stubborn, it can be made softer by damping it with water.

All leather will form wrinkles and pipes in lasting—at the toe especially, at the extreme edge of the leather. Any other work is easier to last than hand-sewn, in which there is only just enough upper leather to hold with the pincers. While lasting the toe, put a few tingles in only, say, one in the centre, then the draft tacks, one on each side. Last up the lining first, knocking the tingles only just through the inner sole, so that they may be drawn out when lasting the upper. When doing this, see that you last the lining smooth previous to proceeding with the upper. Then place a tingle between the centre and draft tacks. There will now be a pucker on each side; these you try to tap or hammer out before putting in more tacks. Every tack put in after should be through the top of one of these pipes, or puckers; and when the toe has enough tacks in it, well hammer it all round, starting at the edge of the sole, and working towards its centre, till you get to the edge of the toe-leather. All the pipes will not be got out by this means, so cut a V-piece out of each remaining, and then tap it down again. or the tops of the ridges may be

skived off. In either case, cut only to within about  $\frac{1}{2}$  in. or  $\frac{1}{4}$  in. of the edge of the last, so that the rivets, pegs, or stitches shall have firm and solid leather to go through. By the above means light leather tops can be lasted without the use of the knife at all.

This chapter may conclude with a few recipes which the shoemaker is sure to find useful at some time or other.

**SHOEMAKERS' SIZE.**—This is made in the following manner : Ingredients,  $\frac{1}{2}$  lb. yellow soap, twopenny-worth of glue, and one quart of soft water. Process : Cut the soap up fine, and break the glue into small pieces ; put them into a saucepan, and pour the water over them ; put it on the fire, and well stir it till it just boils. Pour it out into another vessel to cool. It is then ready for use.

**BURNISHING INK.**—To make good burnishing ink, you will hardly be likely to better the following, which is an American recipe : One pint of alcohol,  $1\frac{1}{2}$  oz. of tincture of iron, 1 oz. of extract of logwood, 1 oz. of pulverised nut-galls,  $\frac{1}{2}$  pt. of soft water, and  $\frac{1}{2}$  oz. of sweet oil ; the oil must be mixed with the alcohol prior to adding the water and other ingredients.

Another : Soft water, 5 gallons ; bring it to a boil, and add 8 ozs. of pulverised logwood extract, keeping it on the fire for three minutes only ; then remove, and stir in  $2\frac{1}{2}$  oz. of gum arabic, 1 oz. of bichromate of potash, and 80 grs. of prussiate of potash.

Another : Soft water, 1 gallon ; extract of logwood, 1 oz. ; boil till the extract is dissolved, take from the fire, and add 2 ozs. of copperas and  $\frac{1}{2}$  oz. each of bichromate of potash and gum arabic, all well powdered.

**BLACK AND WHITE HEEL-BALLS.**—To make black heel-balls, take 8 ozs. of the best beeswax and 1 oz. of tallow, melt, and well stir ; then add 1 oz. of very finely powdered gum arabic, stir again, and mix in lampblack to colour. Another and better recipe is to melt together 2 lbs. of best beeswax and 3 ozs. of suet, and stir in 4 ozs.

of ivory black and 3 ozs. of lampblack; then add 2 ozs. of finely-powdered gum arabic (beat) and 2 ozs. of rock candy. These must be well mixed, and, when partly cold, poured into leaden moulds to the shape and size you wish.

For white or bottom ball, leave out the above colours, and if wanted only as a transparent polish this will suffice; but if needed as a white substance, add a little flake white.

**SHOEMAKER'S WAX.**—Take 4 ozs. of pitch, 1 oz. of resin, and about a  $\frac{1}{4}$  oz. of good tallow, and heat them well on a slow fire in a pipkin or old saucepan. Be very careful they do not take fire, as they are very combustible. Stir this admixture till the resin has melted and mixed well with the other ingredients; then pour the whole into a pail of cold water, and when it has got sufficiently cool to handle, put one hand underneath, and with the other turn the edges over to the centre, to make the mixture into one ball. Take it out, and make it into a roll. Take one end in each hand, and pull it out as long as you can without breaking it. Double it, and pull out again and again; the more it is pulled (or worked), the better and brighter it will be. This done, lay it out on a slab, seeing it does not stick. Roll it out, cut it into strips about 1 in. wide, and cut the strips into pieces about  $1\frac{1}{2}$  in. long; each piece is called a ball. Wax has to be made hard in warm weather, and soft in cold. To make it softer, add more tallow; to make hard, use more resin. It is best to make it hard, as it can easily be made soft without being again heated—simply by working a little tallow into it. The balls of wax should always be kept in water, to prevent their sticking to anything or to each other.

**MAKING FAKE.**—Fake is not sold ready for use, but it can be made in the following way: Take two hard heel-balls and about two-thirds of a white glazing ball, break them up into small pieces, and put them into a small tin box. Proper fake tins can be bought; any

tin will do, but the deeper the rim of the lid is the better, as it will prevent the spirit evaporating when not in use. Just cover the contents of the tin with mineral naphtha, and then put the whole on the hob or in the oven; but the fire must not be fierce, the lid must not be on the box, and it must be well watched, for this process, of course, rarefies the spirit and intensifies its inflammability. The use of fake is to lessen the labour in finishing, for if heel-ball is ironed on, it is very hard to rub off. It is used after the edge has been knifed, rasped, scraped, sand-papered, inked, dried, and nicely ironed with warm irons, which gives it, in itself, a good gloss. The fake is rubbed on with the finger, and when it has set a little, it should be rubbed off with a soft cloth till it leaves a bright even jet-black gloss. Brown work is finished in the same way, and the fake is made just the same, only all white-ball is used, and not any heel-ball.

# INDEX

## A

Awl, Heel, 104  
 —, Home-made, for Heeling, 12, 13  
 —, for Pegging on Sole, 110  
 —, Sewing, 57  
 —, Square or Stitching, 57, 94  
 —, Straight, Fine, 110

Beater, Corner, 122  
 —, for Driving Rivets, 152  
 —, Welt, 122  
 Beginners, Suitable Work for, 16  
 Bench, Shoemakers', 18  
 Bevelled Appearance of Boot Soles,  
 134  
 Black Finish for Bottoms and Top-  
 pieces, 139  
 Blacking Stitches, 36  
 Blind Welts, 95  
 Blinders, Use of, 113  
 Blinding on Top Piece, 115  
 Blind-stabbing, 40-43  
 —, Makeshift, 44  
 Blocking Insoles, 72

—, —, —, for Ironing, 137  
 —, —, —, for Pricking up the  
 Stitch, 136  
 —, —, —, for Stitching on the  
 Sole, 57  
 Boots, Calf, Cleaning, 147  
 —, Falling to Pieces, 23  
 —, Hand-made: how they are put  
 together, 58  
 —, Machine- and Hand-sewn, 19  
 —, Riveted, Making, 148, 153  
 —, Standard Screw, to distinguish,  
 19  
 Bottoms, Buff, 140  
 —, Damped-down, 140  
 —, Fillings for, 52  
 —, Finishing, 139  
 —, White, 141  
 Brad, French, 13  
 Bradding Heel-pieces, 14  
 Breasting the Heels, 129  
 Bristles for Ends of Threads, 61  
 Buffing-Knife, &c., 126  
 —, —, —, Sharpening, 126

Bunion Pieces, Pegging on to Lasts,  
 47  
 Burnisher, Double-handed, 140, 148  
 Burnishing Ink, 155

Calf Boots, Cleaning, 147  
 Casting Model of Foot in Plaster, 69  
 Cement for fastening Gutta-percha  
 Sole, 30  
 Chair for Shoemakers, 18  
 Channel, Rubbing down, 58  
 Channelling the Sole, 91  
 Cleaning Calf Boots, 147  
 Closing in a Patch, 32  
 Cloth for cleaning off Heel-ball, 139  
 Colouring the Soles, 136  
 Corners, Knocking down, 122  
 Corns and Bunions, Allowing for in  
 Fitting Lasts, 68  
 Cost of Grindery, 9  
 Creaking, To Prevent, 89  
 Crease Iron, 142  
 Cut Bill, 14

## D

Draft Tacks, 77  
 Drawing Stitches Tight, 61

Fake, Making, 155  
 —, Using, 156  
 Faults in Heel-making, 116, 117  
 Feather, Tapping Down, 147  
 Felt for Bottom Fillings, 52  
 Fittings for Lasts, 66  
 Flax for Stitching and Sewing, 60, 84  
 Flexura Spring, 111  
 —, Waist, 143  
 Fudge-wheel, 59, 135

Glazer, Double-handed, 140, 148  
 Glazing Ball, White, 142  
 —, Iron, 29, 134  
 Glue, Le Page's Fish, 68  
 Graft, Sewn, 53  
 Grafting Welts, 54, 55  
 Grindery, Cost of, 9

- Guard for Knife when Trimming, 106  
 Gum-dragon for Finishing Waists, 142  
 Gutta-Percha, How to Buy, 9  
 —, Increasing wear-resisting Qualities of, 81  
 — Soles, 29, 30
- Half-heeling, 10, 11, 14  
 Half-tips, Leather-plugged, 15  
 Hammering the Upper, 81  
 — Leather, 72  
 Hand-leather, 61  
 Hand-sewn Boots, To distinguish from Machine-sewn, 19  
 — —, how they are put together, 58  
 Heel Awl, 104  
 — Making, 99-119  
 Heel-ball, Black, 155  
 —, Cleaning off, 139  
 —, Use of, 138  
 —, White, 142, 155  
 Heel-shave, 123  
 Heels, Bradding, 14  
 —, Breasting, 129  
 —, Buffing, 126  
 —, Completing, 114  
 —, Dressing, 106  
 —, Faults in, 116, 117  
 —, Fixing with Screws, 16  
 —, Horsing the Back of, 76  
 —, Importance of Keeping Level, 9, 11  
 —, Military, 118  
 —, Peening, 106, 123  
 —, Pitch of, 104  
 —, Range and Pitch of, 117, 118  
 —, Sand-papering, 127  
 —, Sewing down, 104, 105  
 —, Shape of, 118  
 Holing Inner Sole, 73  
 Hook, Last, 144  
 Horsing the Back of Heel, 76
- I
- Ink, Burnishing, 154  
 Inking the Soles, 136  
 Inner Sole, Holing, 73  
 Insoles, Blocking, 72  
 Instep Leather, 67  
 Invisible Patches, 37-40  
 Iron, Crease, 142  
 —, Double, 132  
 —, Forepart, 133  
 —, Lap, 20  
 —, Waist, 133  
 —, 137, 138, 153
- Joint Leather, 67
- Knife for Breasting Heels, 129  
 Knife, Buffing, 126  
 —, —, Sharpening, 126  
 —, Welt, 128  
 Knifing-up the Seat, 130  
 — the Sole, 89, 90, 130  
 — — Waist, 122
- Lamp, Spirit, for Heating Irons, 137  
 Lap Iron, 20  
 Last Fitting, Preparatory to Re-soling, 50  
 — Hook, 144  
 —, Shape of, 25, 65  
 —, Taking out of Boots, 144  
 Lasting Light Leather Tops, 154  
 —, Principles of, 75  
 — Riveted Boots and Shoes, 149  
 — Stout Leather, 78  
 — Tack, 76  
 — the Toe, 79, 80, 153  
 — the Top, 108  
 Lasts, Fitting up to Measure, 64  
 —, — to Shape of Foot, 68  
 —, Fittings for, 66  
 —, German made, 65  
 —, Iron, Filling up, 68  
 —, Measuring for, 23, 62-64  
 — for Riveted Boots, 69  
 Leather for Awl Handle, 13  
 — for Boot Bottoms, 70  
 — Hand, Making, 61  
 — Joint, 67  
 —, Quality of, 69  
 —, Worked "and Unworked," 10  
 —, Wrinkles and Pipes in, 78, 153  
 Levelling up for Re-soling, 25  
 — the Welt, 128  
 Lifts, Cutting away, 129  
 —, Split, for Heels, Making, 99  
 —, —, Pegging on, 108  
 —, —, Putting on the Heels, 101, 102  
 —, —, for Riveted Boots, 153  
 Long Leather, 67  
 Loop-stitching, 46
- Machine-sewn and Hand-sewn Boots, Distinguishing between, 19  
 — Boots and Shoes, Re-soling, 21  
 Materials for Soling and Heeling, 9  
 Measuring for Lasts, 23, 62-64
- Paring Soles, 26, 27, 55, 90, 91
- Heating, 137

**Paste for Shoemakers, 18**  
**Pasting Socks, 146**  
**Patch, Closing in, 32**  
**Patches, Cutting to Size, 37**  
 —, Difference between Closed and Invisible, 38  
 —, Invisible, 37-40  
**Patching, 32-40**  
**Pattern of Half-heel Piece, Cutting, 12**  
**Peening the Heel, 106, 123**  
 — the Sole, 28, 193  
**Peg-Knife, 145**  
 — Rasp, 145  
**Pegged Seat, Making, 107**  
 — Waist, Fitting Inner Sole for, 112  
 — Work, Lasts for, 69  
**Pegging on Sole and Solepiece, 110**  
 — Split-lift, 108  
**Pincers, 80**  
**Pipes in Leather, Removing, 78, 154**  
**Plaster Cast of Foot, Making, 69**  
**Position of Boot for Pricking up the Stitch, 136**  
 — when Re-welting, 54, 56  
 — when Stitching on the Sole, 57, 58  
**Prick-stitch, Use of, 73**  
**Protectors, Boot, Use of, 31**

**R**

**Rasp for Smoothing, 124, 125**  
**Rasping, 124**  
**Re-welting and Re-soleing Hand-sewn Boots, 50**  
**Rivet Driver, 152**  
**Riveted Boots, Lasts for, 69, 148**  
 — Making, 148, 153  
**Rivets, Iron and Brass, 27**  
 —, their Positions on the Sole, 26  
 — for Soling, 23  
 — their Use in Half-heeling, 11, 15  
**Roughness on Insides, Removing, 145**  
**Rounding the Sole, 89, 90**  
**Rubbing down Channel, when Re-soleing, 58**  
 — Stitches, 36  
**Runner for Pegged Work, 113**  
 — for Riveted Work, 150  
 — or Welt, 21

**Sand-papering, 127**  
**Sands' Solution, 37**  
**Scraper, 23**  
**Screws for Fixing Heels, 17**  
**Seat, Making up, 130**  
 —, Stitching, 47

**Seat, Trimming, 106**  
**Seat-breaker, 107**  
**Seat-Socks, 145**  
**Seat-wheel, 130**  
**Seatpiece, Leather for, 98**  
**Set-off Stuff, Cost of, 70**  
 —, Preparing for Use, 71  
**Sewing, 34, 36**  
 — Awl, 57  
 — down the Heel, 104, 105  
 — in the Seat, 87, 88  
 —, Technical Meaning of, 57  
 —, Thread for, 60  
 —, Tightening Stitches in, 61  
 — U  
 —, Velts, 51, 54  
**Sewn Graft, 53**  
**Shank, 53**  
**Sharpening Buffing-Knife, 126**  
 — Strop, 17  
**Side Linings, 74**  
 — Pin, 76  
**Size, Shoemakers', 155**  
**Skiving, 37, 45**  
**Smoothing Insides of Boots, 145**  
**Snow's Leather-plugged Half-tips, 15**  
**Socks for Ladies' Boots and Shoes, 146**  
 —, Putting, into Boots, 146  
 — for Riveted Boots, 152  
**Sole, Channelling, 91**  
 —, Colouring 136  
 —, Dividing, 72  
 —, Fitting in Riveted Boots, 150  
 —, Inking, 136  
 —, Inner, Holing, 73  
 —, Paring, 26, 27, 55, 90, 91  
 —, Peening, 28, 113  
 —, Riveted, 151  
 —, Rounding or Knifing-up, 89, 90  
 —, Rubbing down, 97  
 —, Stitching on, 56  
**Sole-plane, 125**  
**Soles, Bevelled Appearance of, 134**  
 —, Gutta-percha, 29, 30  
 —, Inferior, Using, 150  
 —, Old, Taking off, 21  
**Solution, Sands', 37**  
 —, Warman's, 37, 39  
**Solvent for "Invisible" Patches, 37**  
**Spring, Flexura, 111**  
**Spring, 70**  
**Split-lifts for Heels, Making, 99**  
 —, Pegging on, 108  
 —, Putting on the Heels, 101, 103  
 — for Riveted Boots, 150  
**Spring Waists, Finishing, 142**  
**Squares, 70**  
**Standard Screw Boots, To Distinguish, 19**  
**Stands for Lasts, 23**  
**Stiffeners, 74**  
**Stitch, Drawing, 49**



- Stitches, Blacking, 36**  
     Mode of Setting in Re-soling, 59  
     —, Rubbing Down, 36  
     —, Yellow, on Welt, 93  
**Stitching, 84, 36, 95, 96**  
     — Awl, 57, 94  
     —, Hemp and Flax for, 60, 84  
     —, Loop, 46  
     —, Seat, 47  
     — on Soles, 56, 59  
     —, Technical Meaning of, 57  
     —, Thread for, 60, 84  
**Stripe Waist, 141**  
**Strop, Sharpening, 17**
- Tacking the Inner Sole, 149**  
**Tacks, Draft, 177**  
     — for Lasting, 76  
**Tapping Down the Feather, 147**  
**Thread, 34, 36, 60**  
     —, Breaking, 60  
     — for Sewing Welts, 84  
     —, Smoothing, 60  
     —, Waxing, 60, 87  
**Tingles for Riveted Work, 149**  
**Tips, Half, Leather plugged, 15**  
**Toe, Lasting, 79, 80, 153**  
**Toe-cap, Loose, to Sew on, 48**  
**Toe Piecing, 46**  
     — Pin, 66  
**Tools for Repairing 18 31**  
**Top-pieces, Finishing 142**  
     —, Blinding on, 115  
**Trimming the Seat, 106**
- Under-sole, Fixing 22**  
**Underlaying, 16, 44 15**
- Uppers, Cracks in, 35**  
     —, Hammering, 81  
     —, Various Kinds of, 69
- W**
- Waist-iron, 130, 131**  
**Waists, Pegged, 113**  
     —, Creasing, 143  
     —, Fiddle, 140, 141  
     —, Finishing, 140, 142  
     —, Flexura, 143  
     —, Lining, 143  
     —, Marking off, 136, 143  
     —, Polishing, 142  
     —, Spring, Finishing, 142  
     —, Square, 89, 132  
     —, Stripe, 141, 142  
**Warman's Solution, 37, 39**  
**Wax, Shoemakers', 153**  
**Wax-end, 34**  
**Waxing Threads, 60, 87**  
**Wear, One-sided, Allowing for 151**  
**Welt Beater 122**  
     — Knife, 128  
**Welts, 21, 70**  
     —, Blind, 95, 136  
     —, Cost of, 51  
     — for Dress Shoes, 83  
     —, Levelling, 128  
     —, Machine-sewn, 19  
     —, Preparing for Use, 51, 80  
     — of Riveted, Pegged and Machine-sewn Boots, 153  
     —, Rounding Edges of, 52  
     —, Sewing, 51, 54 83-87  
     —, Width of, 83  
**Wing, New, 35**  
**Wrinkles and Piles in Leather, 75 153**
- Y**
- Yellow Stitches on Welt, 97**

## “WORK” HANDBOOKS (*continued*)

- Small Electric Apparatus.** *Contents.*—Electrical Units. Galvanometers. Ammeters. Milliameters. The Wheatstone Bridge. Making a 1-inch Spark Coil. Construction of a Tesla Coil. Simple Resistances. Choking Coils. Making a Morse Telegraph Sounder. Index.
- Small Lathes.** *Contents.*—What a Lathe is. Simple Dead-centre Lathe. Wood-bed Lathe, or Horizontal Drilling Machine. Wood-bed Lathe with Iron Headstock. Steel Bar-bed Lathe. Making 2½-inch centre. Lathe with Back gear and Slide-rest. A 1-inch Centre Lathe. Index Plate for Lathe. Making Compound Slide-rest. Turret Head for Lathe Slide-rest. Lathe Accessories and Equipment. Using Lathes. Index.
- Small Workshop Appliances.** This book, illustrated by more than 150 drawings, describes how to make a variety of small appliances—some of them are scarcely dignified enough to be called machines—including a mitre board and cramp, a spindle moulding jig, mortising machines, small machine saws of various kinds, including jig-saws and fretsaws, lathe attachments for planing, sawing, glass-papery, drilling, etc. etc. An essentially practical and useful book for everybody who uses tools or wants to set up a small workshop.
- Soldering, Brazing and Welding.** Chapters include: Various Processes of Joining Metals, Soft Solders, Soldering, Aluminium, Wiping Joints on Lead Pipes, Soldering Gold and Silver Jewellery, Welding Iron and Steel under the Hammer, Managing Blow-Lamps, Electric and Thermit Welding briefly considered, Oxy-Acetylene Welding, etc. etc.
- Ticket-Writing and Sign-Painting.** *Contents include:* The Ticket-Writer's Tools and Materials, Letter Spacing, Using the Brush Roundhand, Italic and Script Letters, Air-Brushed Tickets, Colour, Contrasts in Sign-Writing, Seasonable Signs, Tickets and Posters, etc. etc.
- Tinplate Work.** *Contents.*—Elementary Examples. Hollowing Tinplate. Simple Round Articles. Saucepan Making. Kettle Making. Oil Cooking Stove. Set of Workshop Oil Cans. Fancy Paste Cutters. Lamps and Lanterns, etc. etc. 210 Illustrations.
- Toy Making.** *Contents include:* A Fort and Entrenchments, the Finishing of Wooden Toys, Making of Wooden Wheels for Toys, Rocking Horses, Wooden Motor Cars and Engines, a Pair of Scales, Dolls' Furniture, etc., Wheelbarrows, Making Dolls' Heads, Casting Toys in Metal, etc. etc.
- Violin Making and Repairing.** Suitable Woods. Making the Mould. Making and Fitting the Ribs and Corner Blocks. The Back. The Belly and Bass Bar. Assembling the Body. Cutting the Neck and Scroll. Purfling the Instrument. Fitting the Head and Neck to Body. Varnishing and Polishing. Fitting Up. Stringing. Repairing Violins. Making a Violin Bow.
- Watch Cleaning and Repairing.** *Contents include:* Introduction. Tools and Materials. Cleaning American Key-wound Watches. Cleaning Swiss Lever Watches. Cleaning and Repairing Swiss Cylinder Watches. Cleaning and Repairing English Going-barrel Fusee and Verge Watches. Cleaning and Repairing Modern Keyless Watches. Mainsprings: Selecting, Removing, Fitting, etc. The Lever, Escapement: Its Action, Correction and Repair. Balance, Balance-staff Roller, and Impulse-pin Repairs. Index, etc.
- Wood Finishing:** Comprising Staining, Varnishing and Polishing. *Contents.*—Staining Wood. French Polishing. Fillers For Wood and Filling In. Boding In and Spiriting Off. Glazing and Wax Polishing. Oil Polishing and Dry Shining. Repolishing and Reviving. Hard Stopping, etc. 12 Illustrations.
- Wood-Turning Made Easy:** Fully Illustrated. *Contents include:* The Wood-turning Lathe and its Accessories, Wood turning-tools: Using and Sharpening, Prong-chuck, Face-plate and Cup-chuck Work. More Advanced Face-plate and General Work, Built-up Work and Re-chucking, Measuring, Testing and Finishing. Turning Tool Handles, Turning Finials, Knobs, etc., Turning Legs for Furniture, Making Ornamental Boxes, Turning Stools, Spiral Turning, Miscellaneous Examples of Wood-turning, The Verschoyle Lathe and How to Use it. Index.
- Workshop Arithmetic.** *Contents.*—Signs and Abbreviations. Decimals and Duodecimals. Square Root, Cube Root, etc. Metric System. Simple Workshop Formulæ Explained. Mensuration. Calculating Quantities. Graphs. The Micrometer and Vernier. Cutting Speeds and Speeds of Machinery. Pulley, Belt, and Horse-power Calculations. Screw Cutting. Calculations in Gear wheels. Short Cuts. The Slide Rule Explained. Dimensions of Electrical Units. Index.

*Send postcard for Cassell's Technical Catalogue.*

**Cassell's**



